Academic year:	2021-2022
Unit name:	Ira A. Fulton Schools of Engineering
Director:	Dr. Stephen Phillips
College or school name:	School of Electrical Computer and Energy Engineering
Dean:	Dr. Kyle Squires

ASU Charter:

ASU is a comprehensive public research university, measured not by whom it excludes, but by whom it includes and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves.

ASU Design Aspirations:

Enable Student Success, Transform Society, Fuse Intellectual Disciplines, Value Entrepreneurship, Be Socially Embedded, Conduct Use-Inspired Research, Leverage Our Place, Engage Globally

I. Overview

Provide a written overview of the unit mission and strategic directions. Include a brief summary describing how the unit contributes to the ASU Charter and Design Aspirations, outlining strengths of the unit (e.g. faculty, program offerings, collaborative programs) and any programmatic challenges that might exist.

Table 1: Overview Data Summary of the Unit

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Undergraduate Headcount – Degree Seeking (Fall)	1,395	1,778	2,106	2,162	2,352	2,369	2,488
Undergraduate Headcount – All	1,395	1,778	2,106	2,162	2,352	2,369	2,488
Master's Headcount (Fall)	765	527	578	666	676	656	536
Doctoral Headcount (Fall)	318	336	304	306	305	318	298
# of Undergrad Degrees awarded	164	190	223	254	311	303	320

# of Master's Degrees awarded	377	276	191	286	287	283	291
# of Doctoral Degrees awarded	31	49	54	60	43	44	46
Tenured/Tenure Track (T/TT) faculty Headcount	60	66	68	67	69	~70	~71
Total degrees awarded per T/TT Faculty Headcount	9.5	7.8	6.9	9	9	~9T	~9T
Total Student FTE	1,657	1,684	1,807	2,032	2,030	2,084	1,931

II. Mission and Strategic Directions

Describe the unit's mission statement and vision/strategic directions. Include a discussion of the academic unit's major strengths and areas of prominence in teaching, scholarship, and service in community, national, and international arenas.

The Ira A. Fulton Schools of Engineering are agile, dynamic and dedicated to continuous innovation, student success, faculty excellence, and cultivation of an environment that is diverse, equitable and inclusive. We offer the Fulton - Difference, encapsulated by these principles:

- We focus on student success in the classroom and beyond.
- We accelerate use-inspired research and entrepreneurial engagement.
- Our faculty are dedicated to transformational research and engineering education.
- We engage our stakeholders in industry and the community.
- We make global impacts.

Include your unit's goals/aspirations related to the Charter elements of student, faculty and staff inclusion and success, public value research, and health of the communities you serve, as well as the Design Aspirations: Enable Student Success, Transform Society, Fuse Intellectual Disciplines, Value Entrepreneurship, Be Socially Embedded, Conduct Use-Inspired Research, Leverage Our Place, Engage Globally.

The Ira A. Fulton Schools of Engineering (FSE) at Arizona State University (ASU) is committed to cultivating a culture of diversity, equity and inclusion through the implementation of programs and initiatives that support a collaborative and inclusive environment. With this plan for 2020-2022, FSE outlines a set of strategic goals, objectives, and initiatives that build on our current accomplishments and enable further advances in making the school an accessible and welcoming leader in engineering education.

1. DIVERSITY, EQUITY AND INCLUSION (DEI) FSE uses the following definitions to frame this plan:

1. *Diversity* can be defined as membership that represents a range of identities and of identifying features within a group or organization (e.g., a university). Diversity has frequently been discussed with respect to factors such as race, ethnicity, gender, culture, sexual orientation, religion, age, physical abilities, and socioeconomic status. However, diversity can also be

considered in terms of ideas and expertise (e.g., academic disciplines and methodologies). In engineering, underrepresented minorities (URMs) often include women, persons with disabilities and three racial and ethnic groups—Blacks, Hispanics, and American Indians or Alaska Natives (as defined by the National Science Foundation).

2. ***Equity*** argues that persons should have equal or equivalent opportunities to succeed and thrive regardless of their background or "starting place"—differences in personal or social circumstances should not be allowed to create permanent obstacles. Thus, a more equitable organization is one that (pro)actively works to identify, remove, or mitigate such circumstances and obstacles. Notably, equity is often misunderstood to mean "treat everyone the same." However, equity does not imply equal treatment, but instead demands providing and personalizing resources, without bias, such that everyone has opportunities for equal outcomes.

3. ***Inclusion*** can be defined as the extent to which (a) members of an organization are invited to meaningfully participate in the mission, operation, and leadership of that organization, and (b) the contributions of those members are clearly acknowledged and valued. An organization is considered more inclusive when it not only comprises diverse members, but those members (and their ideas, needs, and perspectives) are welcomed and valued.

With this plan, FSE prioritizes DEI as key factors to our collective success in the 21st century.

2. VISION

Our vision is to embed inclusivity as a core tenet of FSE so that all faculty, staff, academic associates, and students achieve their full potential enabled by an environment that is diverse, equitable and inclusive. We aim to achieve global leadership in engineering education, aligned with an access mission, by recognizing diversity and inclusivity as a source of strength to our collective success.

3. OUR NEED

ASU represents students, faculty, and staff from all 50 states, three territories and over 135 countries, many of those enrolled in FSE. We are one of the largest colleges at ASU and one of the largest, most comprehensive engineering colleges in the United States. As of 2019, FSE is serving over 24,000 students. As such, we share the responsibility and vision to embed inclusivity as a core tenet of engineering education and practice, as well as the drive to incorporate it as a guiding principle in how FSE operates on a daily basis. All FSE students, staff, faculty, academic associates, and their colleagues should be supported in achieving their full potential, empowered by an environment that is diverse, inclusive, and equitable. Our responsibility further extends to global leadership. Our aim is to be a leader in inclusive, 21st century engineering education and practice, by recognizing and promoting diversity as a fundamental source of strength essential to our collective success.

4. GOALS & INITIATIVES

FSE prioritizes **three overarching goals** to frame this plan:

2020-2022 FSE Diversity, Equity, and Inclusion Plan 2

1. Create and maintain a student body and workforce across FSE that is diverse in multiple dimensions and inclusive for all.

2. Empower faculty, staff, students, and academic associates at FSE to embrace the core values and practice of diversity, equity and inclusion.

3. Be a global leader in diversity, equity, and inclusion in engineering.

Building on our accomplishments to date, we will continue designing and implementing activities that target the **10 strategic objectives** outlined below. Accomplishing these objectives has the potential for the most immediate and impactful change to our culture.

- Commit to balancing the diversity of students at all levels to reflect population statistics for female and URMs in Arizona

- Improve student recruitment, persistence and success of target populations

- Increase coordination with industry to increase career-readiness of targeted populations and connect committed employers with these populations

- Foster a culture of inclusion among graduate and undergraduate students and provide an encouraging and supportive environment for all students, faculty, and staff

- Ensure all undergraduate students acquire the knowledge, experience, and cultural competencies necessary to succeed in a multicultural, globally connected world and contribute to the Fulton culture of inclusion

- Balance the diversity of faculty and staff hires, at all levels, with those who are committed to thriving in a DEI environment

- Provide training to students, faculty, and staff to improve DEI awareness

- Establish metrics for faculty and staff evaluations that assess DEI contributions

- Recognize and honor participation and accomplishments related to DEI

- Establish procedures for periodic assessment of diversity and inclusivity and for adjustment of DEI initiatives

Implementation of the strategic objectives dovetail with current FSE- and ASU- efforts (see Narrative) and will target students, faculty, and staff. Specific objectives, activities, and metrics aligned with the goals are articulated below.

5. 2020-2022 IMPLEMENTATION PLANS

As part of our 2020-2022 plans, we will update FSE community and lab spaces with a posted statement outlining FSE's vision and commitment to DEI. DII@FSE, the staff and faculty task force focused on enhancing DEI, will work with the Dean to identify and recommend dedicated spaces (e.g. conference rooms, classrooms, study spaces, etc.) that foster inclusivity. We will post a "commitment to DEI" statement in these common spaces and include a written diversity and inclusion statement in written lab, office, and/or classroom expectations.

Programs and activities listed below directly correspond to the strategic objectives outlined above:

Objective 1. Commit to balancing the diversity of students at all levels to reflect population statistics for female and URMs in Arizona

Undergraduate Outreach and Recruitment

- Improve awareness among target populations of high school students about engineering and associated programs as a career choice through FSE's K-12 outreach and recruitment programs and initiatives.

- Increase opportunities for undergraduates to explore engineering as a socially and personally relevant education pathway to facilitate entry into undergraduate engineering.

- Continue to provide high quality pathway experience programs and constant resources to educate prospective students on opportunities available through FSE. Successful current programming includes [Earned Admissions](#), Engineering Projects in Community Service (EPICS) High School and Young Engineers Shape the World (YESW).

- Increase enrollments in K-12 Outreach programs (e.g., EPICS, First Lego League, YESW) with a focus on school districts that serve large numbers of URM students (i.e., Title I Schools).

- Initiate, develop, and nurture productive and quality partnerships with internal and external stakeholders to enhance diversity in engineering. As one example, we will explore establishment of a Minority in Engineering program (MEP) at ASU, building on successful practices of other MEP programs across the nation.

- Ensure that K-12 Outreach programs involve the families of prospective students and consider the importance of family support to overall student success.

- Develop effective yielding programming events for female applicants in partnership with professional and student organizations, such as Society of Women Engineers (SWE), Women in Science and Engineer (WISE), or Women in Computing that incorporate mentoring, lab visits, industry and faculty speakers, and social activities.

- Integrate recruitment activities into 100% of current EPICS and YESW high schools, and Virtual High Schools Visits, through collaboration with K-12 Outreach team.

Graduate Recruitment

- Participate in the Women in Engineering event at ASU hosted by FSE Recruitment.

- Increase participation in and representation at various conferences that focus on URMs (ex: Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS), Society of Hispanic Professional Engineers (SHPE), SWE, National Society of Black Engineers (NSBE), etc.).

- Investigate the possibility of providing support through selective fee waivers, substituting the GRE requirement with other indicators that demonstrate performance, or other ways to amplify access for URM's.

- Utilize the GEM fellowship program to increase prospective GEM fellows at FSE and create efficiency in the GEM fellows internal process.

- Offer paid 8-week summer research internships (SURI) for qualified U.S. citizens and permanent residents not currently enrolled at ASU in collaboration with industry and university partners (e.g. Historically Black Colleges and Universities, Minority Serving Institutions, Intel Corporation).

- Develop and offer Experiential Learning Grant Funding to graduate students to support participation in and presentations at conferences, track those who receive funding and publish accomplishments.

- Offer the SUMMER AT ASU program to partner schools to develop more partnerships, encourage faculty-to-faculty interactions, and create strong pipelines of students, especially females and URM students.

- Work collaboratively with all program chairs to evaluate and revise the award selection and notification process to remove barriers for URMs and females.

- Create a more equitable distribution of the awards across all schools and programs.

Objective 2. Improve student persistence and success of target populations

- Identify, institutionalize, and scale effective, evidence-based mechanisms that increase entry and persistence in engineering by working with different social institutions through an inclusive large network of actors.

- Implement a comprehensive learner record system to aid academic advisors in guiding students as they in navigating their involvement in extra and co-curricular activities offered within FSE.

- Foster academic success of students through creating learning communities that provide peer tutoring support in key subject areas including mathematics, physics, chemistry, and select engineering courses.

- Advance knowledge of engineers and engineering workplaces through courses and workshops that offer access to industry mentors and site visits.

- Develop students' engineering identity through "future possible self" activities.

- Encourage and facilitate affiliation with a professional engineering society or FSE student organizations.

- Develop strong faculty mentoring and student peer mentoring initiatives.

- Increase diversity in participation at E2, a three-day immersive experience for first-year engineering students, among first generation students to support identity development with the engineering community, create a sense of camaraderie among students, and facilitate the practice of teamwork skills and a culture of teamwork.

- Incorporate learning activities into the E2 curriculum promote DEI.

Objective 3. Increase coordination with industry to improve career-readiness of targeted populations and connect committed employers with these populations

- Create awareness about the ASU Diversity Pledge that enjoins corporations with Fulton's ASEE diversity pledge.

- Work with industry partners to expand industry-led engineering skills and knowledge workshop opportunities for targeted populations.

- Consult with industry partners on their recruitment plans to ensure consideration for diverse qualified students and help them customize engagements to maximize exposure to targeted audiences.

- Work with industry partners to connect their representatives with student organizations and to develop deeper and sustainable relationships that can help deliver diversity events, networking sessions, etiquette dinners, information sessions, and technical talks suited for target audiences.

- Advise and mentor industry representative roles within student organizations to implement best practices and help improve existing industry engagements.

Objective 4. Foster a culture of inclusion among graduate and undergraduate students and provide an encouraging and supportive environment for all students, faculty and staff

1. Establish a college-level access point for information about available resources to address DEI issues.

2. Develop/modify websites and other media to improve ease of navigation and comprehensiveness of information that highlights resources, support services, and accomplishments.

3. Provide undergraduates with DEI training.

4. Identify opportunities to incorporate topics of diversity into existing courses (e.g. as related to ABET accreditation criteria).

5. Regularly evaluate communication and media to ensure publications represent an inclusive culture and include messaging from the Dean regarding vision for DEI.

6. Create opportunities for constituencies to gather to exchange ideas, appreciation, and spirit of community.

7. Implement mechanisms to make mentoring and counseling resources accessible to everyone.

8. Develop a funding plan to ensure ample financial support for DEI initiatives and support services.

9. Leverage the efforts of FSE student organizations focusing on improving diversity and inclusion in engineering and incentivize all Fulton student organizations to incorporate inclusivity measures into their strategic plans.

10. Include quick links on engineering and department web pages to social networks that offer support services to underrepresented groups.

Objective 5. Ensure all undergraduate students acquire the knowledge, experience, and cultural competencies necessary to succeed in a multicultural, globally connected world and contribute to the Fulton culture of inclusion

- Provide opportunities and incentives for students to participate in training such as Sun Devil Civility, a student-led, staff supported initiative that provides students, faculty and staff with the tools to build an inclusive campus culture rooted in civil dialogue and action.

- Disseminate and promote events and activities designed to foster a diverse and inclusive campus culture offered through the EOSS and other campus partners.

- Create opportunities for increased numbers of engineering students to develop intercultural competencies through participation in study abroad experiences as well as connecting to opportunities through FSE's emerging global school initiatives such as TEDI-London.

- Increase participation in curricular and co-curricular programs such as Grand Challenges Scholars program, EPICS, and Entrepreneurship + Innovation, which promote competencies such as empathy, self-awareness, multi-disciplinarity through personal engagement, understanding different cultures through multicultural experiences, and finding engineering solutions that serve people and society reflecting social consciousness.

Objective 6. Balance the diversity of faculty and staff hires, at all levels, with those who are committed to thriving in a DEI environment

- Require an "Inclusion and Equity Statement" from faculty applicants, similar to "Research Statements" and "Teaching Statements."

- Ask applicants to articulate the ways in which they will promote inclusive and equity cultures in their classrooms and labs, and how these values will shape their research, teaching, and/or service as faculty in FSE and ASU.

- Request staff position applicants to provide a diversity statement and explain their commitment to diversity and inclusion as it pertains to the job for which they are applying.

- Require staff hiring committees to reference this document during the interview process, giving the potential employee an opportunity to discuss how they would demonstrate their commitment in daily operations.

- Evaluate implementing an "Inclusion Resource Officer" role within FSE. This individual would complete additional training, have knowledge of FSE and campus resources, be responsible for acting as a first point of contact to report any issues or reports of noncompliance, and develop a process for handling these concerns.

Objective 7. Provide training to students, faculty, and staff to improve DEI awareness

- Schedule a variety of training opportunities for relevant/key topics. Select training courses will be required for faculty serving in particular roles. For example, members of committees that evaluate others (e.g., Promotion & Tenure), establish policies (e.g., curriculum committees), work in various labs (e.g. accessibility and accommodations for persons with disabilities) can be required to participate in training on bias and inclusivity.

- Require microaggressions and implicit bias training for all new faculty and staff; to include contextualized scenarios where parties interact, as is common in the workplace and to acknowledge interdependence of all groups.

- Refresh and update training material every two years as FSE culture and environment shifts in alignment with this Diversity Plan.

- Establish recertification requirements for faculty and staff to take a refresher course every two years.

Objective 8. Establish metrics for faculty and staff evaluations that assess DEI contributions

- Include section in faculty evaluations that acknowledges and encourages participation in (a) DEI training/workshops and (b) events (e.g., a film screen and discussion about relevant social issues). Tone of evaluations should be positive and encouraging (i.e., reward participation) rather than negative and critical (i.e., punishing lack of participation).

- Create a formal program that recognizes and incentivizes voluntary participation in existing DEI workshops and events. Recognition could occur at multiple levels such as awarding units with high participation additional discretionary funds to support DEI initiatives.

- Add an assessment component for demonstration of DEI into the annual staff evaluation tool.

- Recommend DEI be included as a component of scheduled quarterly conversations between supervisors and staff.

- Offer additional training opportunities for personnel with a demonstrated need to improve. Training would differ from the biannual training, instead focusing on contextualization of diversity and inclusion as integrated into daily routine and relevant to staff functions.

Objective 9. Recognize and honor participation and accomplishments related to DEI

- Create seed funding for incorporating DEI principles, problems, and goals into research projects. Many engineering endeavors strive for immediate connection to human needs and goals or "downstream" applications to human efforts. Seed funding could encourage researchers to think about these human connections in addition to the core "engineering problem."

- Create seed funding for entrepreneurial activities that seek to extend/disseminate the benefits of engineering innovations to under-served or under-resourced populations.

- Provide training that helps researchers articulate "broader impacts" that incorporate social good/justice (i.e., how will the research contribute to a more equitable world?).

- Recognize staff members who contribute to an inclusive and supportive culture for diversity.

- Create a separate and prestigious award for DEI to honor those who vanguard FSE's commitment to embed these values into the framework of FSE. Similar to other annual awards, monetized incentives will be attached to the recognition.

- Public recognition of the recipients at the annual awards program.

Objective 10. Establish procedures for periodic assessment of diversity and inclusivity and for adjustment of DEI initiatives

- Implement a data management plan.

- Capture and track metrics as outlined in Section 8.

- Implement an Inclusion Resource Officer role within FSE, as described in objective 6.

6. SCHOOL-WIDE COMMITMENTS

In the spring of 2019, FSE established the Diversity and Inclusion Initiative at FSE Task Force (DII@FSE), which brings together representatives from faculty and staff across each of the seven schools and Dean's Office. DII@FSE meets regularly and is central to the efforts of formulating and codifying the faculty- and staff-facing DEI efforts (current and proposed), as outlined in this plan. The task force conducted a benchmarking study of internal resources and activities as well as external programs and best practices. The task force combined with FSE Academic and Student Affairs (ASA) and FSE leadership to develop this plan.

An important strategy for FSE is to not recreate initiatives that are already offered across ASU, and as such, we will continue to leverage established campus-wide resources such as:

- [Office of Diversity, Equity, and Inclusion (ODEI)](#)

- [Educational Outreach and Student Services (EOSS)](#)

- [Disability Resource Center (DRC)](#)

- [Office of Inclusion and Community Engagement](#) (within the Provost's Office)

- [Committee for Campus Inclusion (CCI)](#)

- Enhanced university-wide benefits and policies: ASU is continually revising and refining university policies to best serve all members of our communities. Striving to be an employer of choice, ASU understands the importance of work-life balance and wants to support the development of every employee in all aspects of their lives: at work, at home and in the community. Recent policy enhancements as of July 2019 include: Increase paid parental leave benefit from six to 12 weeks for parents (including birth mothers, fathers, and adoptive parents); adoption and fertility subsidies; paid time off for volunteer service; and an emergency child and elder care program. FSE commits to supporting faculty and staff in the use of these benefits.

Implicit Bias and Inclusion Training

ODEI focuses on university employees and regularly hosts training regarding topics such as sexual harassment, accommodations for persons with disabilities, service animals, diversity in the workplace, microaggressions, and implicit bias. For faculty, FSE required the 2019-2020 college-level Promotion and Tenure committee members to attend a workshop on microaggressions and implicit bias. Building on this pilot implementation we will explore how to integrate similar and ongoing trainings within the personnel committees throughout the seven FSE schools. Staff may enroll in training on microaggressions and implicit bias delivered by ODEI periodically or upon unit request, but training is not mandatory. FSE plans to develop student-facing programming that covers implicit bias.

We understand, however, that this is not enough. FSE plans to enhance training opportunities to include workshops on relevant/key topics for faculty serving in particular roles. For example, members of committees that evaluate others (e.g., Promotion & Tenure), establish policies (e.g., curriculum committees), work in various labs (e.g. accessibility and accommodations for persons with disabilities) would benefit by participation in training on bias and inclusivity. We propose requiring microaggressions and implicit bias training for all new faculty and staff; to include contextualized scenarios where parties interact, as is common in the workplace and to acknowledge interdependence of all groups. We propose refreshing training every two years as FSE culture and environment shifts in alignment with this Diversity Plan. As such, staff would be required to recertify their training every two years.

7. ACCOUNTABILITY

The Dean of the college and the Vice Dean of Strategic Advancement will oversee the implementation of this plan. They will be supported by the ASA and the DII@FSE Task Force for implementation and monitoring of initiatives outlined in this plan. As we strive towards the objectives outlined herein, we will also implement a strategy for equitable implementation of DEI initiatives across students, faculty and staff.

8. METRICS & ASSESSMENT

We plan to implement a data management plan with an evaluation component for periodic assessment of our efforts towards enhanced diversity and inclusivity as part of our strategic goals (see objective 8 and 10). By capturing and tracking metrics on the measures outlined below, ASA and the DII@FSE Task Force will be able to make recommendations to the Dean as improvements are needed. Progress will be tracked using the following metrics. Numbers in parentheses correspond to strategic objectives outlined in Section 5.

- Climate survey data and follow up results: online surveys, exit surveys, event feedback, training feedback, etc. (1, 2, 3, 6, 7)

- Clarification of short-term and medium-term outcomes for engineering pathway programs (1, 2, 3, 4, 5)
- Improvement in the collection of demographic data across pathway and student-facing programs (1, 2, 4, 5, 7)
- Development of systems and strategies for tracking students along engineering pathways from high school and community college to ASU FSE
- Number of hiring committees convened with enhanced DEI focus (6)
- Number (or percentage) of faculty and staff hires that enhance diversity (6)
- Number of evaluation committees convened with enhanced DEI focus (6)
- Number (or percentage) of invited seminar speakers that are URM or female (1, 5, 7, 9)
- Calendar of DEI events conducted or promoted throughout the year – speakers, workshops, recognition and awards (4, 5, 7)
- Training courses offered (7)
- Awards issued or recognized (9)
- Number of DEI concerns reported (6, 10)

What is the status and relevance of your unit's strategic plan?

III. Peer and Aspirational Peer Comparisons

Table 2: Summary of Comparisons of Your School/Department at ASU and Your Peer/Aspirational Peer Institutions

Institution	Undergrad Headcount (Degr-Seek)	Graduate Headcount (Degr-Seek)	Tenure Track Faculty	Total Faculty (FTE)	Staff FTE	External Funding ($)	Other data	Rank (if available)
ASU	2400	900	74	84	26	$46M		31, 22, 2
Mich	604	855	70	85	NA	$49M		6
Tex AM	1500	555	71	82	NA	$31M		12
WashSt	1998	203	46	56	NA	$10M		70
PennSt	1541	512	95	103	NA	$32M		25
UC Irvine	1000	308	38	49	NA	$9M		40
U ariz	486	346	33	40	NA	$6M		46

Discuss/analyze the unit's ranking relative to peers/aspirational peers including metrics when available. (Please use data provided by the Office of Institutional Analysis and other disciplinary sources as well as your peer data listed above.)

The EE programs are ranked by US News and World Report. These rankings were created to drive magazine subscriptions and subsequently for web content subscriptions. As such they are inconsistently available to the public. Underserved groups appear less likely to avail themselves of the rankings. They are widely shared among academic programs as some measure of recognition. Our EE programs are relatively highly ranked at both the graduate and undergraduate levels.

The most recent graduate program ranking is 31. The number has been stable, ranging between 26 and 32 for the past two decades. This is a purely reputational survey of department chairs with no data or performance metrics included. The stability of this relatively strong ranking is helpful since it drives qualified graduate student applicants to our program. The very large inertia of the reputational ranking presents a significant challenge in moving the ranking to the next tier of schools. Our efforts to communicate our faculty accomplishments in research and industry engagement will continue as our most effective means to positively impact this ranking.

Our undergraduate ranking is 22. There is little historical data since undergraduate specialty programs have not been consistently ranked over time. Our "online program" ranking is a very strong 2. As we have a very widely recognized online BSE EE program we believe that this driving the ranking. Our efforts to communicate our student and alumni accomplishments will continue as our most effective means to positively impact these rankings.

Satisfactory Progress Policy (Undergraduate)

Academic standing

Ira A. Fulton Schools of Engineering good standing

Students are expected to select and successfully complete courses that lead to the timely completion of their degree programs. Students are said to be in good standing if they fulfill all the following:

- maintain acceptable GPAs
- enroll and complete critical tracking requirements
- complete courses each semester that are applicable to their degrees

University academic warning

An undergraduate student with a cumulative GPA of less than 2.00 at the end of their first semester (fall or spring) is considered to be in the status of University Academic Warning. If after one term with an academic warning a student still has not achieved the minimum GPA standard of 2.00, the student will be placed on probation for at least one additional term. If a student's minimum GPA first falls below the standard in a term that is not the student's first term at ASU, the student will be placed on probation. Failure to return to good academic standing after being placed on probation may result in disqualification.

A student with an academic warning is considered in conditional good standing and is permitted to enroll.

Whether a student's status is an academic warning or probation, the student must meet with an academic success specialist to discuss academic success strategies for the subsequent semester and develop a success plan for returning to university academic good standing. At the discretion of the student's college or school, that plan may require successful completion of UNI 220 Academic Refresher/Mindset Connections.

Ira A. Fulton Schools of Engineering probation

There are many reasons why some students do not make satisfactory progress. These students are placed on Ira A. Fulton Schools of Engineering academic probation to ensure they get the extra attention and resources they need that will help them get back in good standing. Working with an academic advisor to plan a strategy for success is crucial. Students may be required to reduce their course loads (13 credit hours maximum), retake courses or even take courses outside of their programs.

To return to academic good standing in the Ira A. Fulton Schools of Engineering, students on probation need to earn a minimum semester GPA of 2.25 and earn a minimum cumulative ASU GPA of 2.00 at the end of the probation semester. If enrolled in only one course, a grade of "C+" (2.33) or better and a minimum cumulative ASU GPA of 2.00 is required to obtain academic good standing. Students who meet either the semester GPA requirement or the cumulative ASU GPA requirement at the end of their first probationary semester may be continued on probation. Courses completed during summer sessions are not used to reevaluate a student's probationary status.

Conditions for Ira A. Fulton Schools of Engineering probation

A student is placed on college or university probation when specific academic expectations are not met. Some conditions trigger an automatic placement on probation whereas others trigger an automatic review of the student's case to determine if probation is warranted. When a probation review is triggered, the final decision and any conditions of probation are determined at the program level.

Automatic probation is triggered by any of the following:

- two successive semesters with GPAs less than 2.00
- an ASU cumulative GPA less than 2.00

Automatic review (borderline) is triggered by any one of the following:

- a semester with a GPA less than or equal to 2.00
- a cumulative GPA in the major of less than 2.00

Ira A. Fulton Schools of Engineering continuing probation

A student on probation or continuing probation at the university level is placed on college-level continuing probation status when specific academic expectations are not met. When a continuing probation review is triggered, the final decision and any conditions of continuing probation are determined at the college level.

To return to academic good standing in the Ira A. Fulton Schools of Engineering, students on continuing probation need to earn a minimum semester GPA of 2.25 and earn a minimum cumulative ASU GPA of 2.00 at the end of the probation semester. If enrolled in only one course, a grade of "C+" (2.33) or better and a minimum cumulative ASU GPA of 2.00 is required to obtain academic good standing.

Automatic continuing probation is triggered by any of the following:

- a student on probation does not attain a semester GPA of 2.25 or greater and has a cumulative GPA of at least 2.00 at the end of the probation semester
- a student on probation or continuing probation obtain a semester GPA of 2.25 or greater and has a cumulative GPA less than 2.00

Ira A. Fulton Schools of Engineering ineligibility

Students who are on continuing probation and fail to meet the schools' retention standards become ineligible to continue working toward a degree within the Ira A. Fulton Schools of Engineering.

Ineligibility occurs if the continuing probationary student does any of the following:

- does not attain a semester GPA of 2.25 or greater and has a cumulative GPA of at least 2.00 at the end of the probationary semester
- has already been on probation for two consecutive semesters
- fails to complete any courses appropriate for the degree during each semester

Ineligible students are subject to the following limitations:

- Students who change colleges may not register for courses in the Ira A. Fulton Schools of Engineering unless the courses are required by their new majors.
- Students who register for courses in the Ira A. Fulton Schools of Engineering may be withdrawn from these courses any time during the semester they are registered.

Ineligible students are encouraged to consider these options:

- Students may be eligible to change their majors to other colleges if they are in university academic good standing and have acceptable cumulative GPAs; the acceptable GPA level depends on the number of hours of completed coursework. Students should contact their advisor to determine if this is an option for them.
- Students may take non-engineering courses during summer sessions.
- An ineligible student may apply for readmission to the college after one calendar year.
- Students may request a status review by contacting the Office of Academic and Student Affairs.

Ira A. Fulton Schools of Engineering disqualification

Students who are on probation or continuing probation and fail to meet the schools' retention standards become disqualified to continue working toward a degree within the Ira A. Fulton Schools of Engineering.

Disqualification occurs if the student on probation or continuing probation does not attain a semester GPA of 2.25 or greater and has a cumulative GPA less than a 2.00 at the end of the probation semester.

Disqualified students are subject to the following limitations:

- A disqualified student is not allowed to register in a fall or spring semester at the university. If the student has already registered for a future fall or spring semester, the registration is canceled.
- A student who has been disqualified may apply for readmission to the college after one calendar year.
- A disqualified student may not attend as a nondegree student.
- If a disqualified student elects to attend another university or two-year college, any credits earned there will not affect the ASU cumulative GPA. A course repeated elsewhere will not result in a replacement of a grade earned at ASU.

Student responsibilities

Students need to make many decisions as they complete their degrees. While the schools and the university have a number of resources available to help with decision-making (e.g., faculty, courses, advisors and tutors), students are expected to take responsibility for their decisions.

Ira A. Fulton Schools of Engineering good standing

Students are expected to select and successfully complete courses that lead to the timely completion of their degree programs. Students are said to be in good standing if they fulfill all the following:

- maintain acceptable GPAs

- enroll and complete critical tracking requirements

- complete courses each semester that are applicable to their degrees

University academic warning

An undergraduate student with a cumulative GPA of less than 2.00 at the end of their first semester (fall or spring) is considered to be in the status of University Academic Warning. If after one term with an academic warning a student still has not achieved the minimum GPA standard of 2.00, the student will be placed on probation for at least one additional term. If a student's minimum GPA first falls below the standard in a term that is not the student's first term at ASU, the student will be placed on probation. Failure to return to good academic standing after being placed on probation may result in disqualification.

A student with an academic warning is considered in conditional good standing and is permitted to enroll.

Whether a student's status is an academic warning or probation, the student must meet with an academic success specialist to discuss academic success strategies for the subsequent semester and develop a success plan for returning to university academic good standing. At the discretion of the student's college or school, that plan may require successful completion of UNI 220 Academic Refresher/Mindset Connections.

Ira A. Fulton Schools of Engineering probation

There are many reasons why some students do not make satisfactory progress. These students are placed on Ira A. Fulton Schools of Engineering academic probation to ensure they get the extra attention and resources they need that will help them get back in good standing. Working with an academic advisor to plan a strategy for success is crucial. Students may be required to reduce their course loads (13 credit hours maximum), retake courses or even take courses outside of their programs.

To return to academic good standing in the Ira A. Fulton Schools of Engineering, students on probation need to earn a minimum semester GPA of 2.25 and earn a minimum cumulative ASU GPA of 2.00 at the end of the probation semester. If enrolled in only one course, a grade of "C+" (2.33) or better and a minimum cumulative ASU GPA of 2.00 is required to obtain academic good standing. Students who meet either the semester GPA requirement or the cumulative ASU GPA requirement at the end of their first probationary semester may be continued on probation. Courses completed during summer sessions are not used to reevaluate a student's probationary status.

Conditions for Ira A. Fulton Schools of Engineering probation

A student is placed on college or university probation when specific academic expectations are not met. Some conditions trigger an automatic placement on probation whereas others trigger an automatic review

of the student's case to determine if probation is warranted. When a probation review is triggered, the final decision and any conditions of probation are determined at the program level.

Automatic probation is triggered by any of the following:

- two successive semesters with GPAs less than 2.00
- an ASU cumulative GPA less than 2.00

Automatic review (borderline) is triggered by any one of the following:

- a semester with a GPA less than or equal to 2.00
- a cumulative GPA in the major of less than 2.00

Ira A. Fulton Schools of Engineering continuing probation

A student on probation or continuing probation at the university level is placed on college-level continuing probation status when specific academic expectations are not met. When a continuing probation review is triggered, the final decision and any conditions of continuing probation are determined at the college level.

To return to academic good standing in the Ira A. Fulton Schools of Engineering, students on continuing probation need to earn a minimum semester GPA of 2.25 and earn a minimum cumulative ASU GPA of 2.00 at the end of the probation semester. If enrolled in only one course, a grade of "C+" (2.33) or better and a minimum cumulative ASU GPA of 2.00 is required to obtain academic good standing.

Automatic continuing probation is triggered by any of the following:

- a student on probation does not attain a semester GPA of 2.25 or greater and has a cumulative GPA of at least 2.00 at the end of the probation semester
- a student on probation or continuing probation obtain a semester GPA of 2.25 or greater and has a cumulative GPA less than 2.00

Ira A. Fulton Schools of Engineering ineligibility

Students who are on continuing probation and fail to meet the schools' retention standards become ineligible to continue working toward a degree within the Ira A. Fulton Schools of Engineering.

Ineligibility occurs if the continuing probationary student does any of the following:

- does not attain a semester GPA of 2.25 or greater and has a cumulative GPA of at least 2.00 at the end of the probationary semester
- has already been on probation for two consecutive semesters
- fails to complete any courses appropriate for the degree during each semester

Ineligible students are subject to the following limitations:

- Students who change colleges may not register for courses in the Ira A. Fulton Schools of Engineering unless the courses are required by their new majors.
- Students who register for courses in the Ira A. Fulton Schools of Engineering may be withdrawn from these courses any time during the semester they are registered.

Ineligible students are encouraged to consider these options:

- Students may be eligible to change their majors to other colleges if they are in university academic good standing and have acceptable cumulative GPAs; the acceptable GPA level depends on the number of hours of completed coursework. Students should contact their advisor to determine if this is an option for them.

- Students may take non-engineering courses during summer sessions.

- An ineligible student may apply for readmission to the college after one calendar year.

- Students may request a status review by contacting the Office of Academic and Student Affairs.

Ira A. Fulton Schools of Engineering disqualification

Students who are on probation or continuing probation and fail to meet the schools' retention standards become disqualified to continue working toward a degree within the Ira A. Fulton Schools of Engineering.

Disqualification occurs if the student on probation or continuing probation does not attain a semester GPA of 2.25 or greater and has a cumulative GPA less than a 2.00 at the end of the probation semester.

Disqualified students are subject to the following limitations:

1. A disqualified student is not allowed to register in a fall or spring semester at the university. If the student has already registered for a future fall or spring semester, the registration is canceled.

2. A student who has been disqualified may apply for readmission to the college after one calendar year.

3. A disqualified student may not attend as a nondegree student.

4. If a disqualified student elects to attend another university or two-year college, any credits earned there will not affect the ASU cumulative GPA. A course repeated elsewhere will not result in a replacement of a grade earned at ASU.

IV. Graduate Education

Please include in the table below a listing of the titles of all graduate degrees offered by the unit as it appears in the Online Academic Catalog.

Table 3A: Current Graduate Degree Programs Offered by Unit

Electrical Engineering MSE: ESEEMSE

Electrical Engineering MS: ESEEMS

Electrical Engineering PhD: ESEEPHD

Arts, Media and Engineering MS: ESAMEMS

Arts Media and Engineering PhD: ESAMEPHD

Computer Engineering (Electrical Engineering) MS: ESCENEMS

Computer Engineering (Electrical Engineering) PhD: ESCENEPHD

Robotics and Autonomous Systems (Electrical Engineering) MS: ESRASEEMS

Nuclear Power Generation Graduate Certificate: ESNPGGRCT

Sensor Signal & Information Processing Graduate Certificate

Plan Code	2014 Fall	2015 Fall	2016 Fall	2017 Fall	2018 Fall	2019 Fall	2020 Fall	2021 Fall
ESNPGGRCT			2.0		1.0			2.0
ESCENEMS	58.0	43.0	61.0	108.0	150.0	130.0	92.0	102.0
ESEEMS	85.0	67.0	70.0	62.0	59.0	50.0	40.0	30.0
ESEEMSE	619.0	413.0	447.0	495.0	467.0	462.0	388.0	496.0
ESAMEMS	3.0	4.0		1.0				
ESRASEEMS						14.0	16.0	33.0
ESCENEPHD	4.0	6.0	4.0	15.0	28.0	31.0	35.0	44.0
ESEEPHD	310.0	326.0	297.0	289.0	276.0	287.0	263.0	265.0
ESAMEPHD	4.0	4.0	3.0	2.0	1.0			1.0

Table 3B: Headcount of Students Concurrently Enrolled in Majors or Graduate Certificates in the Unit

Graduate Degrees		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
All ECEE listed above	Fall Enrollment (headcount)	1083	863	884	972	982	974	834
	Degrees Awarded	408	325	245	346	330	327	337

Table 4: Graduate Student FTE and Other Graduate Curricular Offerings

Please expand as needed.

Graduate FTE and Other Curricular Offerings		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
	Graduate student FTE	901	788	785	832	852	903	737

A brief description of each program including the core requirements, the concentrations offered, and the culminating experience requirements for the major must be provided.

EE MSE DEGREE REQUIREMENTS

The MSE is a professional degree requiring a minimum of 10 courses of at least 3 or 4 credits each (30 hours minimum) and a final comprehensive exam. There is no thesis.

Requirements include:

- o A minimum of five EEE courses
- o A maximum of four courses (combined) from the following groups: any two 400-level, EEE 591, EEE 590, and FSE 500-level 8
- o A minimum of three EEE 500-level courses (not including EEE 591, EEE 590, and FSE 500)
- o It is highly recommended to take two courses outside of your area of specialization
- o A maximum of one Reading and Conference (EEE 590) or FSE 500-level course

A final comprehensive exam in the area of specialization completes the MSE requirements. The exam is given each semester at the end of the sixth full week of classes.

Comprehensive Examination The MSE requires a comprehensive examination. It is administered typically in the sixth full week of the fall and spring semesters and consists of a written exam in the major area of study. It covers material through the master's degree level. The area committees make up the written exam. Only students with a GPA of 3.0 or better can take the exam. A grade of 60% or more is required to pass this exam. The student must sign up for the exam by the end of the second week of classes. The MSE Comprehensive exam signup will be emailed to eligible students. A description of the exam can be found in the Comprehensive Exam Guide. Any student failing the comprehensive exam may petition to

attempt it a second time the very next time (after the failure) it is offered. There is no guarantee that the petition will be accepted. A third opportunity to take the exam will not be permitted.

EE MS DEGREE REQUIREMENTS

The MS is a research degree requiring a minimum of 30 credits that is only offered in person on the Tempe campus. These credits must include a minimum of eight courses of at least 3 or 4 credits each (24 hours minimum) and six hours of EEE 599 (Thesis).

Requirements include:

- A minimum of four EEE courses
- A maximum of four courses (combined) from the following groups: any two 400-level, EEE 591, EEE 590, and FSE 500-level.
- A minimum of three EEE 500-level courses (not including EEE 591, EEE 590, and FSE 500.)
- It is highly recommended to take two courses outside of your area of specialization • A maximum of one Reading and Conference (EEE 590) or FSE 500-level course.
- Six credits of EEE 599 (Thesis)

A final oral exam in defense of the thesis completes the MS degree requirements.

Advisory Committee

MS students select a faculty mentor who will serve as chair through direct contact with the faculty. The chair of the advisory committee must be a member of the electrical engineering program graduate faculty with endorse-to-chair approval. The MS thesis advisor will help the student select the other two members of the advisory committee. The advisory committee should be formed and approved by the Graduate Program Chair as early as possible, but certainly no later than the semester before graduation.

Research and Thesis

Because the MS is a research degree, it requires a thesis. A student presenting a thesis must register for six credits of thesis (EEE 599). Opportunities for participation in research are abundant in electrical engineering, so a student in a program that requires a thesis is expected to select a thesis advisor and become an active participant in a research program in the first year of study. A thesis usually requires a continuing effort over two or three semesters. Thesis credit (EEE 599) can be graded with options of C, D, E, or Z. A grade of Z indicates a course in progress and is at the discretion of the thesis advisor. Such a grade may later be changed to a Y grade or left on the permanent record. An oral examination in defense of the thesis will be conducted by the students advisory committee. The oral defense must be scheduled through Graduate College 10 business days in advance. The thesis must be submitted to Graduate College for format review at least 10 calendar days before the oral defense. No exceptions to this rule will be made. In addition, the thesis must be delivered to all committee members at least 10 calendar days before the oral defense. When the student completes the thesis, the academic advisor assigns a grade of Y to the thesis credits, which indicates successful completion of the thesis and passing the oral defense. If a student does not complete the thesis, the thesis mentor may assign a failing grade of E to the thesis credits.

ELECTRICAL ENGINEERING (ART, MEDIA AND ENGINEERING) MS

The concentration in arts, media and engineering has been established as collaboration between the electrical engineering program at ASU and the Herberger Institute for Design and the Arts. The AME program represents an ambitious interdisciplinary research community at ASU that is focused on the parallel development of media hardware, software, content and theory. AME research addresses the discontinuity that exists between media content and media technologies through a paradigm shift in

media and arts training. The objective is to produce a new kind of hybrid graduate student who draws creativity from the arts and methodology from engineering sciences. AME trains students to integrate principles of digital signal processing and multimedia computing with artistic ideas and objectives, with the goal of enabling new paradigms of human-machine experience that directly address societal needs and facilitate knowledge. More information can be found on the ECEE website

The EE (AME) MS program requires that students complete eight courses and six thesis credits. The eight courses generally follow the EE MS degree requirements, with the exception that roughly 1/3rd of the coursework (2 or 3 courses) be from the AME department. Of the six thesis credits, four of the credits must be EEE 599 and 2 of the credits must be AME 599.

Electrical Engineering PhD

THE PHD DEGREE The doctoral programs in Electrical Engineering are organized by whether the student has a master's degree. Direct PhD means that a student is generally going directly from a bachelor's program into a doctoral program and does not have a master's degree. There is only one application to the PhD program and students are required to list their educational history on the application. The differences in the degree requirements are listed below.

COURSE REQUIREMENTS In order to graduate, a grade point average of 3.5 or greater is required for all courses taken beyond the master's degree. Students may elect to take more than 18 hours of PhD class work and may be required to do so by their advisors. It may be necessary to take more than 18 hours of class work to improve the GPA to 3.5 or above. Hours beyond the required 18 described above may be graduate level classes or omnibus classes. "Omnibus" refers to additional research credits or additional courses. Please speak with your chair for recommendations and with your assigned academic for additional information. Please see below for the course and credit requirements for Direct PhD students and Regular PhD students.

Direct PhD Course requirements

Direct PhD students are required to complete 84 semester hours of academic credit beyond the bachelor's degree. The following table illustrates the PhD degree course requirements:

DESCRIPTION	NUMBER OF HOURS	COMMENTS
Master's in passing	30	10 classes following the MSE degree requirements
500 level or above	12	Four classes of 3 or 4 credits each. EEE 591 is not allowed. No more than one EEE 790 (Reading and Conference) is allowed.
Research or omnibus	18	500 level (and above) classes. EEE 591 is allowed
Research	12	EEE 792 (Select your chair from the course listing)
Dissertation	12	EEE 799 (Select your chair from the course listing)
Total hours required	**84**	

Master's in Passing for Direct PhD students

Direct PhD students can apply for a master's in passing (MIP). The master's degree in passing will be the MS degree. The degree must be requested by the student through their academic advisor. 13 The student must have completed 10 courses (following the EE MSE degree requirements) with at least a 3.0

GPA and the PhD Qualifying exam. After completing 10 courses and the PhD Qualifying Exam (form and report are required to be submitted to the academic advisor), students should work with their academic advisor to have the proper form submitted to the Graduate College. Once that is approved, the student will need to complete the MS iPOS that lists the 10 classes completed and apply for graduation. Once the MIP is awarded, students are still active in the PhD program unless they withdraw from the program.

Regular PhD Course Requirements PhD students are required to complete 84 semester hours of academic credit beyond the bachelor's degree. The following table illustrates the PhD degree course requirements:

DESCRIPTION	NUMBER OF HOURS	COMMENTS
Master's degree	30	From any approved institution
500 level or above	18	At least six classes of 3 or 4 credits each. At least 9 credits of EEE classes. EEE 591 not allowed. No more than one EEE 790 (Reading and Conference)
Research or omnibus	12	500 level (and above) classes. EEE 591 is allowed
Research	12	EEE 792 (Select your chair from the course listing)
Dissertation	12	EEE 799 (Select your chair from the course listing)
Total hours required	**84**	

ELECTRICAL ENGINEERING (ART, MEDIA AND ENGINEERING) PHD

The concentration in arts, media and engineering has been established as collaboration between the electrical engineering program at ASU and the Herberger Institute for Design and the Arts. The AME program represents an ambitious interdisciplinary research community at ASU that is focused on the parallel development of media hardware, software, content and theory. AME research addresses the discontinuity that exists between media content and media technologies through a paradigm shift in media and arts training. The objective is to produce a new kind of hybrid graduate student who draws creativity from the arts and methodology from engineering sciences. AME trains students to integrate principles of digital signal processing and multimedia computing with artistic ideas and objectives, with the goal of enabling new paradigms of human-machine experience that directly address societal needs and facilitate knowledge. More information can be found on the ECEE website

The EE (AME) PhD program generally follows the EE PhD requirements with the exception that 2/3rd of the coursework, research, and dissertation credits be EEE and the remaining 1/3rd must be AME. For example, if a student must complete six courses, four of the courses must be EEE courses and the remaining two courses must be AME courses. The same pattern follows for research and dissertation credits.

RESEARCH AND DISSERTATION CREDITS

A student is expected to become an active participant in a research program during the first semester of study in the PhD program. Research leading to a dissertation is performed under the direction of the supervisory committee. The candidate must register for a total of at least 12 credits of research (EEE 792) and 12 credits of dissertation (EEE 799). Research (EEE 792) will be graded with options of C, D, E, Z, or Y. A grade of Y indicates satisfactory progress and is at the discretion of the dissertation advisor. Such grades may later be changed to a letter grade or left on the permanent record. The Y is the usual grade for research. The Z grade is typically used for dissertation credits until you complete your dissertation defense. When the dissertation is satisfactorily completed, a grade of Y is given for successful completion

of the dissertation and for passing the oral dissertation defense. If a student does not complete the dissertation, the dissertation advisor may assign a failing grade of E for EEE 799.

SUPERVISORY COMMITTEE

Sometime during the first semester in the PhD program the PhD student must form a graduate supervisory committee. The chair of the committee will be the faculty member who directs the student's research program. The chair of the committee must be a member of the electrical engineering program graduate faculty with endorse-to-chair approval. The Graduate Faculty list is maintained by Graduate College. The supervisory committee will be composed of at least four members (the chair and the other members). Only three members need attend the qualifying exam, but at least four must attend the PhD comprehensive exam and the final dissertation oral. At least half of the committee members must be tenure or tenure track faculty in ECEE.

QUALIFYING EXAMINATION

Every student who wishes to pursue the PhD in electrical engineering must pass a Qualifying Examination. Because the PhD is primarily a research degree, the Qualifying Examination is designed to test the candidate's research skills and abilities. The exam consists of a written research paper and an oral presentation of the research. When determining a topic, the student and their committee chair should keep in mind that this milestone is to determine if a student is qualified to do doctoral level research and if they would be successful in future research endeavors. The exam is administered by the student's graduate supervisory committee. PhD students who have a master's degree should aim to complete the qualifying exam by the end of their second semester in the program. Direct PhD students should aim to complete the qualifying exam in the semester in which they are completing their 10th course. If a student does not wish to take the exam according to the above schedule, but wishes to continue in the program, must petition the School Graduate Committee for permission to take the exam at a later date. Petitions must be received well in advance of the required exam date. There is no guarantee that the Graduate Committee will approve such requests. If a student is completing their MS thesis at ASU and would like to use their MS thesis defense as their qualifying exam, they may submit the required form with the signatures and exam information. If the graduate supervisory committee advisor is not changed, this exam will be supervised by the MS committee. These members may, or may not, be part of the doctoral graduate supervisory committee. If the doctoral advisor is not part of this committee, the advisor should be added to the committee. The exam is graded on a pass/fail basis. A passing grade indicates that the committee believes that the student is capable of doctoral research. A failing grade indicates that the committee believes that the student is incapable of conducting the level of research required for the PhD. As a result, students who fail the exam will be removed from the program. The student must submit their report to their committee 10 working days in advance. Once the exam is completed, the student must submit the form (which can be found on our website) and a copy of their report to their assigned academic advisor.

COMPREHENSIVE EXAMINATION AND ADMISSION TO CANDIDACY

A student must pass a comprehensive examination before being formally admitted to candidacy for the PhD. The examination is administered by the student's graduate supervisory committee after the student has essentially completed coursework. The student must have an approved formal plan of study before taking the exam. The exam is typically completed in the 6th semester of study at ASU. If the exam is not completed by the end of the 6th semester, approval for registration must be obtained by your committee chair and the Graduate Program Chair. The comprehensive examination will be given by the four members of the supervisory committee and will consist of written and oral parts. The written part will be composed of a background paper on the area of research, includes the current status of this area, a summary of work the student has already done, and a thesis proposal. The oral part will be an examination on the contents of the paper in general and thesis proposal. Following completion of the exam, the completed "PhD Comprehensive Examination" form must be returned to the Graduate Program

Chair. The student will be granted candidacy by Graduate College immediately after passing the comprehensive exam.

DISSERTATION DEFENSE

Upon completion of the dissertation, the student must successfully defend it by passing an oral examination. This defense may be conducted no earlier than one semester after the student's admission to candidacy. Ideally, the exam should be conducted no earlier than six months after the student's formal admission to candidacy. Students are responsible for communicating with their committee chair when determining if they are ready to hold their dissertation defense. If the committee chair determines the student's work is sufficient, the student should send a copy of their dissertation to their committee members and work to find a date and time that works for the entire committee to attend the defense. Students are responsible for knowing the deadlines set by Graduate College when scheduling their defenses. Information can be found on the Graduate College website. Students must formally schedule their defense through the iPOS at least 10 business days prior to their defense date. When doing so, they should upload their dissertation for format review. No exceptions to this rule will be made. In addition, the thesis must be delivered to all committee members at least 10 calendar days before the oral defense. At least 50% of the committee, including the chair or one co-chair, must attend the defense. Members attending remotely must be reported at the time of scheduling your oral defense. A list of archival publications published by the student and related to the dissertation must be presented at the defense. The form for this is located at on the ECEE Forms website. The form must be signed by the PhD committee and submitted to the advising office to keep on file.

Computer Engineering (Electrical Engineering) MS

MS Degree Requirements

A minimum of 30 credit hours of coursework beyond the bachelor's degree and deficiency courses are required to complete the MS degree. All Master's students are required to develop and submit an Interactive Plan of Study (iPOS) through your MyASU page during the first semester at ASU. The iPOS should be developed with the aid of the student's faculty advisor. The CEN Graduate Academic Advisor, acting on behalf of the Graduate Program Chair, will initially advise the student. Students pursuing the non-thesis option will list the Program Chair as their faculty advisor. Students pursuing the thesis option should seek out a faculty member in his or her area of study to serve as an advisor and committee chair.

Summary of Degree Requirements

Six hours of Core courses • CSE 551 – Foundations of Algorithms (3) • EEE 554 – Random Signal Theory (3)

All students are required to take the core courses, CSE 551 Foundations of Algorithms and EEE 554 Random Signal Theory in their first two semesters. Students in the Computer Systems Concentration (CEN-CS) are required to take CSE 551 in their first semester. Students in the Electrical Engineering Concentration (CEN-EE) are required to take EEE 554 in their first semester. These courses have a prerequisite of CSE 310 for CSE 551 and EEE 350 for EEE 554. If students are deficient in CSE 310 or EEE 350, they may choose to take these concurrently with the core courses, or they can petition to take these in their first semester before taking the core courses.

Twelve Credits of graduate-level CEN Area courses that fulfill the concentration requirement

The area courses in the graduate Computer Engineering program are partitioned into five (5) areas of study and listed in the table located on the CEN handbooks website. These courses will be referred to as Computer Engineering Area (CEN-Area) courses.

The five (5) areas of study are: 1) Autonomous Systems and Robotics (ASR) 2) Communication and Networks (CN) 3) Distributed, Dependable and Secure Systems (DDSS) 4) Multimedia and Signal Processing (MSP) 5) VLSI, Architecture, and Embedded Systems (VAES)

• 6 of the 12 credit hours should be courses covering two (2) of the five (5) CEN areas (CEN areas listed below).

• Concentration requirement

      o CEN-CS Concentration: 9 credits CSE or CEN and 3 credits EEE or CEN

      o CEN-EE Concentration: 9 credits EEE or CEN and 3 credits CSE or CEN

Elective Courses

Elective courses from an approved list of elective courses, CEN Area Courses, or any 500 level CSE/CEN/EEE course. 12 credits of electives for Non-Thesis Option. 6 credits of electives plus 6-credit CEN 599 - Thesis for Thesis Option.

      • Up to 12 credits of approved combined courses (5xx/4xx) and 400 level courses can be taken and these count as electives. Of these 12 credits, 6 of them are allowed to be CSE 4XX. Please refer to the list of approved 5xx/4xx electives that can be found on the handbook's website.

1. If a 400-level course is combined with a 500-level course, CEN students will be required to enroll in the 500-level course.
2. Up to 3 credits of Reading & Conference (CEN 590)
3. All graduate-level CSE, EEE, or CEN courses can be taken as electives
4. Other graduate-level Math, Science, and Engineering courses can count as electives if they are on the approved list of electives. Please speak to your advisor if you would like to enroll in a course outside of the CSE or EEE departments.
5. Internship courses do not count toward the degree 30-credit requirement

Culminating Experience for MS Non-Thesis Students – Comprehensive Examination

Comprehensive Examination: A comprehensive examination is held once in fall and once in spring. A student must be in good academic standing and have a cumulative graduate grade-point-average (CUM GPA) 3.0 or higher, graduate grade-point-average (500 level courses GPA) 3.0 or higher, 3.0 overall iPOS courses, and completed at least 18 credit hours including the 2 core courses to take the Comprehensive Examination. The Comprehensive exam entails questions on the core courses and might include questions from the pre-requisites of these courses. Details of the comprehensive examination will be communicated to the students in the semester the exam is being administered.

Failing the comprehensive examination is considered final unless the supervisory committee and the head of the academic unit recommend, and the Dean of the Graduate College approves a reexamination. Only one re-examination is permitted. A petition with substantial justification for reexamination, endorsed by the head of the academic unit must be approved by the Dean for the Graduate College before students can take the examination a second time. If the petition is approved, a student is allowed to retake the examination immediately following the period in which the examination was failed. If the student's petition for re-examination is not approved or the student fails the re-examination, the CEN program will recommend to Graduate College to remove the student from the MS program.

Culminating Experience for MS Thesis Students – Written and Oral Defense

A thesis requires a research advisory committee comprised of at least three faculty members including the committee chair. The committee chair must be a CEN faculty member approved to chair a committee. The two additional members are chosen jointly by the committee chair and the student to facilitate the student's research. A least one additional member should be from the CEN faculty. Please refer to the Computer Engineering website for a list of CEN faculty and their research and to the Graduate College website for a list of faculty with the right to chair in Computer Engineering. The written thesis and a successful oral defense constitute their final examination. A majority pass vote by the student's committee is required to graduate.

Computer Engineering (Electrical Engineering) PhD

Doctoral degree requirements

Degree requirements for the PhD include a minimum of 84 semester hours beyond the bachelor's degree. Students are allowed up to 30 credit hours from a previously awarded master's degree to count towards the degree requirements for the doctoral program, if approved by the student's supervisory committee and the Program Chair.

 The PhD is comprised of several milestones, which all students are required to pass successfully before graduation.

• Filing an approved Plan of Study

• Completion of the core, area, and elective coursework along with research and dissertation credits.

• Passing the Qualifying Exam.

• Passing the Comprehensive Examination and obtain approval of the dissertation prospectus to advance to candidacy.

• Successful oral defense of an approved written dissertation.

Formulation of Plan of Study

In the first year of study at ASU, each student must formulate and submit an official plan of study (iPOS). The plan of study should satisfy the degree requirement as described in this handbook. Coursework completed that is not listed in the approved course list or has not had a prior approval may not count

toward a student's degree requirements if the coursework does not satisfy the degree requirements as described in this handbook. Students must list a faculty chair or co-chairs and obtain their approval before submission of the initial plan of study. All iPOSs must have the approval of the Program Chair and the Graduate College Associate Dean.

The plan of study may be amended as the student progresses through the program with the approval of the student's faculty advisor and the CEN Program Chair.

Courses with grades of "D," "E," "W," and "I" cannot be included on an iPOS and should be replaced with another course or complete the course with the grade is "I" within one year from the date the grade is posted. A check sheet can be found on the CEN website as a guide when creating the iPOS. The check sheet must be submitted to the advising office for approval along with the electronic submission of the iPOS.

Internship courses do not count toward the degree 84-credit requirement.

Core courses

There are 6 credit hours required core courses for the PhD in Computer Engineering

• CSE 551 – Foundations of Algorithms (3)

• EEE 554 – Random Signal Theory (3)

All students are required to take the core courses, CSE 551 Foundations of Algorithms and EEE 554 Random Signal Theory in their first two semesters. Students in the Computer Systems Concentration (CEN-CS) are required to take CSE 551 in their first semester. Students in the Electrical Engineering Concentration (CEN-EE) are required to take EEE 554 in their first semester. These courses have a pre-requisite of CSE 310 for CSE 551 and EEE 350 for EEE 554. If students are deficient in CSE 310 or EEE 350, they may choose to take these prior to registering for the advanced graduate level courses. CSE 310 and EEE 350 will not count towards degree requirements. Students are encouraged to consult an academic advisor to ensure they meet the minimum pre-requisites.

CEN Area courses

Total credits hours for program area courses:

• minimum of 12 credit hours. (Approved transfer courses can count towards the area courses)

• No more than 12 credits of CEN 690

The five (5) area courses in the graduate Computer Engineering program are listed in the table located on the CEN handbooks website. These courses will be referred to as Computer Engineering Area (CEN-Area) courses.

• Concentration requirement is met by taking the correct prefix courses from the CEN Area course list for your degree concentration.

  o CEN-CS Concentration: 9 credits CSE or CEN and 3 credits EEE or CEN

  o CEN-EE Concentration: 9 credits EEE or CEN and 3 credits CSE or CEN

The five (5) areas of study are:

1) Autonomous Systems and Robotics (ASR)

2) Communication and Networks (CN)

3) Distributed, Dependable and Secure Systems (DDSS)

4) Multimedia and Signal Processing (MSP) 10

5) VLSI, Architecture, and Embedded Systems (VAES)

Elective Courses

0- 30 credits of electives selected from an approved list of elective courses or CEN Area Courses. The combined set of area courses and elective courses should be chosen to ensure the student has adequate preparation to pursue research in the chosen area of the thesis.

• No more than 6 hours of 400-level coursework can be included on the graduate student program of study.

• No more than 12 hours of combined courses (4XX/5XX) can be included on the graduate student program of study. • No more than a total of 12 hours of a combination of 400-level and combined courses (4XX/5XX) can be included on the graduate student program of study.

      o All 400-level and combined (4XX/5XX) courses count towards elective credits.

Reading and Conference (CEN 690 and CEN 790) – Maximum 18 credit hours.

CEN 690 can be used as area coursework if needed and deemed appropriate by the student's faculty and the Graduate Program Chair. CEN 790 can be used as elective credits. Combined students cannot register for more than 18 credit hours of Reading and Conference. Reading and conference can be taken once a semester for a maximum of 3 credits each. Students are required to submit the required form and override request.

The student must get written approval from the supervising faculty outlining the coverage of the content. The Independent Study form must be approved by the Program Chair and will be placed in the student's file. After completion of the independent study, the student needs to submit a written report to the faculty supervising the independent study.

Once the report is approved by the supervising faculty, the report and the independent study grade form need to be submitted to the student's assigned advising staff to be given to the CEN Program Chair for review and approval.

Once 18 credits of CEN 690/790 have been completed and show on the official transcripts, no further CEN 690/790 credits will be permitted.

Research credits (CEN 792) 24 credit hours of Research (CEN 792)

Dissertation credits (CEN 799) 12 credit hours of Dissertation (CEN 799)

Supervisory Committee

During the first semester in the PhD program, the student must select a faculty advisor who has the right to chair from the Computer Engineering Program Graduate Faculty. The list of faculty members is available at CEN Website and Graduate College. At least one semester before taking the Qualifying Examination, the student must form a graduate supervisory committee. The chair of the committee will be the PhD faculty advisor who directs the student's research program. The role of the supervisory committee is to provide guidance and direction for the student's educational and research plan. As such, the committee must have the necessary expertise to guide and evaluate research in the proposed dissertation area. A minimum of four committee members is required, including the committee chair or

two co-chairs. The committee chair or one of the co-chairs must be a Computer Engineering Graduate Faculty member with the right to chair. At least two members must be CEN Graduate Faculty members. The fourth member can be a CEN Graduate Faculty member or an outside member of the CEN Graduate Faculty. The supervisory committee must be approved by the CEN Program Chair and by Dean of Graduate College before taking the Qualifying Examination.

Qualifying Exam

Every student who wishes to pursue the PhD in Computer Engineering must pass a Qualifying Examination. Because the PhD is primarily a research degree, the Qualifying Examination is designed to test the candidate's research skills and abilities. The exam consists of a written research paper and an oral presentation of the research paper to the graduate supervisory committee. The research topic will typically be chosen by the student in collaboration with the committee chair and the graduate supervisory committee. More specifically, the research paper will typically present a state-of-the-art survey of the student's research topic area. The survey should give a comprehensive overview of the existing prior research in the topic area and identify the limitations of the existing approaches in the topic area. Ideally, the survey should present a coarse outline of avenues for addressing the identified limitations through original research that will later form the core of the PhD dissertation. A well-done survey can form the basis for the related work chapter of the PhD dissertation.

Students initiate their exam in collaboration with their supervisory committee. The supervisory committee, and the chair in particular, will guide the student regarding the content of the written and oral exam. The student will need to prepare a paper to the committee chair's specifications and send it to the committee at least 2 weeks prior to the exam. The student needs to coordinate with the committee to find a date, time, and location that is acceptable for all parties. The student needs to work with their advising office to reserve a conference room. After the exam, the student must submit the form with the required signatures and a copy of the written portion of the exam to their advising office. This can be submitted in person or via email.

The student should take the exam before the end of the fourth semester in attendance at ASU as a PhD candidate. If a student does not wish to take the exam according to the above schedule but wishes to continue in the program, he/she must petition the Graduate Program Chair for permission to take the exam at a later date. Petitions must be received well in advance of the required exam date. There is no guarantee that the Graduate Committee will approve such requests. If the student does not have a supervisory committee, they still must petition to delay taking the exam. In this situation, the Graduate Program Committee will review the petition. If a petition to delay the qualifying exam is denied, this constitutes as failure of the exam and therefore will result in removal of the program.

Students completing a Master of Science degree in computer engineering at ASU can combine the MS oral defense with the qualifying exam. When a student plans on remaining within the same area after completing their MS degree at ASU, the qualifying examination may be taken simultaneously with the final oral defense of the MS thesis. Assuming that the graduate supervisory committee advisor is not changed, this exam will be supervised by the MS committee. These members may, or may not, be part of the doctoral graduate supervisory committee. If the doctoral advisor is not part of this committee, the advisor should be added to the committee. The graduate supervisory committee will be formed when the student's official program of study is filed.

The result of the exam is a pass or fail. A passing result indicates that the committee believes that the student is capable of doctoral research. A failing result indicates that the committee believes that the

student is incapable of conducting the level of research required for the PhD. Therefore, students who fail the exam will be removed from the program. Only one exam is allowed. The student must submit their report to their committee 10 working days in advance. Once the exam is completed, the student must submit the form (which can be found on our website) and a copy of their report to their assigned academic advisor.

Comprehensive Exam and Dissertation Prospectus

The purpose of the doctoral comprehensive examination and dissertation prospectus is to address critical areas of the student's research topic and to ensure the research design and methods aligns well with the intended subject. The comprehensive exam consists of two components: an oral and a written component. The exam is typically completed in the 3rd year or the 6th semester of study at ASU for PhD students with a previously awarded MS degree, and by the 4th year or the 9th semester of study at ASU for Direct PhD students. The Comprehensive Exam takes approximately six weeks. A student should plan in advance and must ensure that he/she is registered at all times in at least one credit graduate level course (e.g. 580, 792, 795, or 799). This includes if either part of the written or oral portion of the comprehensive exam will be held in summer.

Satisfactory Progress Policy (Graduate)

PROBATION, GPA REQUIREMENTS, AND SATISFACTORY ACADEMIC PROGRESS

Academic excellence is expected of graduate students. To be eligible for a graduate degree, a student must achieve a grade point average of 3.0 or better in all work taken for graduate credit, exclusive of deficiencies, and in all work specifically included on the plan of study. The required grade point average for master's students is 3.0; however, doctoral students must maintain a grade point average of 3.5.

Three different grade point averages that are considered by Graduate College are

1. Cumulative GPA: GPA from all classes taken once admitted into a graduate program

2. Graduate GPA: GPA form all graduate level classes taken at ASU, regardless of when they were taken

3. iPOS GPA: GPA from all courses and credits listed on the student's iPOS

A student who is not progressing satisfactorily toward a degree may be withdrawn from the program by Graduate College upon recommendation by the program. The policy of the Ira A. Fulton Schools of Engineering for academic probation and dismissal of graduate students follows below.

A PhD student may be recommended for dismissal from the graduate program who fails to make satisfactory progress toward the degree. Satisfactory progress means completing the PhD requirements in a timely manner. These requirements include the Qualifying Exam, Comprehensive Exam, course requirements, selection of a chair and supervisory committee, filing of a plan of study, and completing research as assigned by the supervisory committee chair. Additional requirements may be imposed by the supervisory committee.

For grading policies, please refer to the University Registrar Services Grading Policy website. The grade of "I" (Incomplete) can only be given by an instructor when a student is unable to complete a course because of illness or other conditions beyond the student's control. The Request for Grade of Incomplete

form must be submitted to the ECEE graduate advising office and approved by the Graduate Program Chair before the incomplete grade is posted by the instructor.

IRA A. FULTON SCHOOLS OF ENGINEERING (ENGINEERING) ACADEMIC STANDARDS

Policy for Maintaining Satisfactory Academic Progress A student who has been admitted to a graduate degree program in the Ira A. Fulton Schools of Engineering, with either regular or provisional admission status, must maintain a GPA of 3.00 or greater in all the following:

1. all work taken for graduate credit (courses numbered 500 or higher)

2. coursework in the student's approved plan of study

3. all postbaccalaureate course work taken at ASU (overall GPA)

A student will be placed on academic probation if one or more of the student's GPAs listed above is less than 3.00. Students will be notified by mail when placed on academic probation.

A student will earn academic good standing by obtaining a 3.00 or greater in the GPAs listed above by the time the next nine hours are completed. Coursework such as research and dissertation and any course that is graded with a "Z" (in progress) or "Y" (satisfactory) cannot be included in these nine hours.

A student may be recommended for dismissal from a graduate program if the student fails to increase all the GPAs listed above to 3.00 or greater by the time he or she completes at least nine credit hours as defined in the previous paragraph.

A student may appeal actions concerning dismissal by petitioning the program in which they are enrolled.

Academic units in the Ira A. Fulton Schools of Engineering can expand this policy statement to include additional policy governing the satisfactory academic progress of the students in their graduate programs.

Policy for maintaining satisfactory academic progress

A student who has been admitted to a graduate degree program in the Ira A. Fulton Schools of Engineering, with either regular or provisional admission status, must maintain a GPA of 3.00 or greater in all the following:

- all work taken for graduate credit (courses numbered 500 or higher)

- coursework in the student's approved plan of study

- all postbaccalaureate course work taken at ASU (overall GPA)

A student will be placed on academic probation if one or more of the student's GPAs listed above is less than 3.00. Students will be notified by mail when placed on academic probation.

A student will earn academic good standing by obtaining a 3.00 or greater in the GPAs listed above by the time the next nine hours are completed. Coursework such as research and dissertation and any course that is graded with a "Z" (in progress) or "Y" (satisfactory) cannot be included in these nine hours.

A student may be recommended for dismissal from a graduate program if the student fails to increase all the GPAs listed above to 3.00 or greater by the time he or she completes at least nine credit hours as defined in the previous paragraph.

A student may appeal actions concerning dismissal by petitioning the program in which they are enrolled.

Academic units in the Ira A. Fulton Schools of Engineering can expand this policy statement to include additional policy governing the satisfactory academic progress of the students in their graduate programs.

Graduate Student Profiles

Table 5: Master's Student Admissions and Profile

Master's programs		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	College 2020-21
Number of Applicants		2532	2269	2162	1781	1206	1254	1359	
Number of Admissions		729	517	687	916	887	862	788	
Number of New Students Enrolled		289	150	264	284	271	254	129	
Selectivity		28.8%	22.8%	31.8%	51.4%	73.5%	68.7%	58%	
Yield		39.6%	29%	38.4%	31%	30.6%	29.5%	16.4%	
Average GRE	Verbal	150	152	151	150	150	150	150	
	Quantitative	163	163	162	162	162	161	161	
Headcount (Fall)		765	527	578	666	676	656	536	
% women		23.5%	23.5%	24%	24.8%	23.4%	22.4%	21.5	
% Ethnicity	American Indian	0%	0%	0%	.3%	.4%	.5%	.4%	
	Asian American	2.6%	4.7%	4.8%	4.2%	4.7%	5.2%	8.0%	
	Pacific Islander	0%	0%	0%	0%	0%	0%	0%	
	African American	.9%	1.9%	2.1%	1.5%	1.8%	2.0%	3.5%	
	Hispanic	2.5%	2.7%	3.5%	3.8%	5.9%	6.3%	9.7%	
	2 or More Races	.4%	.6%	1%	1.2%	.6%	.8%	1.3%	
	White	10.3%	18%	16.6%	16.1%	15.1%	18.6%	23.5%	
	Unknown	.4%	.2%	.3%	.3%	1%	1.7%	2.2%	
% Minority total									
% International		82.9%	71.9%	71.6%	72.7%	70.4%	65.1%	51.3%	
Degrees awarded		377	276	191	286	287	283	291	

Master's Student Analysis

Please refer to *Guiding Questions for Graduate Student Analysis* (Located at the end of this template**)** to address:

Background
Goal is to educate students for a career in electrical engineering.

Some masters students engage in research. Our research is use inspired.

Structure and requirement changes are regularly driven by faculty suggestions through the graduate program committee.

Recruitment and Admissions
We can support about 300 Masters students across our programs.

Applications to FSE graduate programs are done in an entirely online manner. Applicants, by paying only one application fee, can apply to up to 4 programs, which we encourage especially for students interested in a computing graduate degree (computer science, computer engineering, software engineering, or information technology). Admissions decisions are made by individual graduate programs, through a process led by the respective graduate program chair and informed by the respective graduate program committee. In all cases a wholistic evaluation of the applications is made, to reduce reliance on single metrics like undergraduate GPA and GRE scores. Note that several FSE graduate programs are eliminating the GRE requirement; we anticipate this trend will continue. Our recruiting process includes both domestic and international components. Domestically, we target underrepresented students by focusing on conferences catering to such students, including the Society of Hispanic Professional Engineers (SHPE), the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS), the National Society of Black Engineers (NSBE), etc. We reach an even larger domestic audience through the Engineering National Graduate Institutional Name Exchange (ENGINE), which provides contact information for junior and senior engineering students. Internationally, we participate in recruiting events organized by Education USA in various countries, including India, as well as other recruiting events. When travel is permitted, we generally travel twice per year to India and occasionally to other countries, including China and Taiwan. Such trips when conducted in the fall semester target increasing applications, while those conducted in the spring semester are focused on increasing yield. In all cases, we strive to attract a highly qualified, diverse group of applicants to our masters and doctoral programs.

Applications from China have declined in number significantly over the past 5 years. Continued strength in applications from India have enabled us to maintain robust student enrollment.

Program Structure
We have an orientation and welcome in the Fall. We offer orientation webinars several times during the year. This has been very effective.

We have a comprehensive handbook located on our graduate programs web page. [The ECEE Graduate Program Handbook - School of Electrical, Computer and Energy Engineering (asu.edu)](https://ecee.engineering.asu.edu/graduate-program-handbook/)
https://ecee.engineering.asu.edu/graduate-program-handbook/

The Fulton Schools of Engineering grade appeal procedures are based on the universities policy that can be found here. Students must begin with and complete the informal process prior to any decision on whether a formal hearing is warranted.

Student Access and Inclusion

For recruitment, in addition to participating in events catering to underrepresented domestic students, like those described above (SHPE, SACNAS, NSBE, etc.), we participate in the Graduate Education for Minorities (GEM) fellowship program that is limited to underrepresented students and that requires cost share from the participating graduate program. Another recruiting mechanism with significant participation of underrepresented students is our Summer Research Internships (SURI) program, which enables junior, senior, and master's students the opportunity to conduct research under the guidance of an ASU FSE faculty member. Although the primary purpose of the SURI program is to enhance PhD recruitment, we have partnered with several historically black colleges and universities (HBCUs) as well as Intel, Facebook, and other companies to support underrepresented students to participate in the program. Our retention efforts are also bolstered by the SURI program, as well as other programs that provide research opportunities for existing students like the master's Opportunity for Research in Engineering (MORE) program that provides a stipend and funding to support research. Such research programs, by giving students the opportunity to work closely with an ASU FSE faculty member, enrich the graduate experience and thereby help to retain students.

FSE is dedicated to diversity and inclusion as a core value, and this is reflected in part through our numbers, such as being number five in the nation for engineering bachelor's degrees awarded to underrepresented minorities. Although more needs to be done, faculty can learn through the Teaching Community of Practice series mentioned above on inclusive pedagogy, including how to take into consideration race and ethnicity, disability, religion, country of origin, etc. in the classroom. The FSE Diversity and Inclusion Initiative funds relevant projects, such as increasing minority involvement in manufacturing engineering and the Employment Assistance & Social Engagement (EASE) program that provides assistance to students with an autism spectrum disorder. Finally, the Fulton Schools Diversity Difference programs help to create experiential learning opportunities for faculty, staff and students to engage in active dialogues on topics related but not limited to diversity within the university.

Pedagogical Innovation

One area of innovation is the development of transdisciplinary graduate degrees that enables students from a variety of engineering backgrounds to come together and take classes from multiple programs. This started with the computer engineering MS and PhD degrees, which draw on classes from both computer science and electrical engineering. More recently FSE launched the MS in Robotics & Autonomous Systems degree that now has concentrations spanning five FSE schools, in Artificial Intelligence, Electrical Engineering, Mechanical & Aerospace Engineering, Biomedical Engineering, and Systems Engineering. We are currently developing another multi-concentration program in data science.

Additionally, there is increasing recognition that "soft skills" are vital in graduate engineering, and can distinguish our graduates from those from other universities. Although our current offerings are still limited, one graduate course that provides such nontechnical skills is EEE 598 Manuscript Writing for Engineers. Most programs enable students to take at least one elective class, and we encourage students to explore classes outside of their core technical program. Soft skills can also be learned through internships, which we have streamlined and made more accessible to all our graduate students (especially international students).

 All FSE faculty are encouraged to participate in the Teaching Community of Practice seminar series, which depending on circumstances is delivered either face-to-face or virtually. This seminar series explores topics such as assessment, game-based learning, inclusive pedagogy, etc., and draws upon the resources available through the FSE Learning and Teaching Hub. The Hub not only supports faculty who participate in the Teaching Community of Practice, but also provides pedagogical guidance and instructional feedback to FSE faculty in part through learning designers and collaborative programs, workshops, etc.

Professional Development

We support students who engage with our professional society, the IEEE. This includes on campus seminars, off campus events with the IEEE Phoenix section and internationally recognized conferences. Some of our students participate in the many entrepreneurial activities at ASU.

Student Success

Our graduates are in very high demand and nearly everyone has an employment opportunity at the time of graduation. Some of our international students would prefer a US placement but this is not always achieved.

Best Practices

Our professional student advising operation is world-class.

Table 6: Doctoral Student Admissions and Profile

Doctoral Programs		2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	College 2020-21
Number of Applicants		339	287	322	304	307	268	241	
Number of Admissions		133	91	124	146	135	127	93	
Number of New Students Enrolled		53	43	44	51	52	51	35	
Selectivity		39.2%	31.7%	38.5%	48%	44%	47.4%	38.6%	
Yield		39.8%	47.3%	35.5%	34.9%	38.5%	40.2%	37.6%	
Average GRE	Verbal	150	152	151	150	150	150	150	
	Quantitative	165	166	165	162	162	161	161	
Headcount (Fall)		318	336	304	306	305	318	298	
% women		12.6%	12.2%	13.2%	14.1%	14.4%	13.8%	14.1%	
% Ethnicity	American Indian	0.3%	0.6%	0.7%	0.7%	0.7%	0.3%	0.0%	
	Asian American	1.9%	2.7%	3.3%	3.6%	2.6%	2.5%	2.0%	
	Pacific Islander	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
	African American	0.6%	0.3%	0.3%	0.3%	0.3%	0.6%	1.0%	
	Hispanic	2.5%	1.8%	2.0%	3.3%	4.3%	3.8%	3.0%	

	2 or More Races	0.0%	0.0%	0.0%	0.3%	0.7%	0.6%	0.3%	
	White	16.0%	16.4%	14.1%	15.4%	15.1%	15.4%	16.1%	
	Unknown	3.1%	1.5%	2.3%	1.6%	1.0%	1.3%	0.7%	
% Minority total									
% International		75.5%	76.8%	77.3%	74.8%	75.4%	75.5%	76.8%	
Degrees awarded		31	49	54	60	43	44	46	

Doctoral Student Analysis

Please refer to *Guiding Questions for Graduate Student Analysis* (Located at the end of this template) to address:

Background

Goal is to educate students for a career in electrical engineering.

Doctoral students engage in research. Our research is use inspired.

Structure and requirement changes are regularly driven by faculty suggestions through the graduate program committee.

Recruitment and Admissions

We can support about 300 Masters students across our programs.

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Applications from China have declined in number significantly over the past 5 years. Continued strength in applications from India have enabled us to maintain robust student enrollment.

Program Structure

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Additionally, there is increasing recognition that "soft skills" are vital in graduate engineering, and can distinguish our graduates from those from other universities. Although our current offerings are still limited, one graduate course that provides such nontechnical skills is EEE 598 Manuscript Writing for Engineers. Most programs enable students to take at least one elective class, and we encourage students to explore classes outside of their core technical program. Soft skills can also be learned through internships, which we have streamlined and made more accessible to all our graduate students (especially international students).

All FSE faculty are encouraged to participate in the Teaching Community of Practice seminar series, which depending on circumstances is delivered either face-to-face or virtually. This seminar series explores topics such as assessment, game-based learning, inclusive pedagogy, etc., and draws upon the resources available through the FSE Learning and Teaching Hub. The Hub not only supports faculty who participate in the Teaching Community of Practice, but also provides pedagogical guidance and instructional feedback to FSE faculty in part through learning designers and collaborative programs, workshops, etc.

Professional Development

We support students who engage with our professional society, the IEEE. This includes on campus seminars, off campus events with the IEEE Phoenix section and internationally recognized conferences. Some of our students participate in the many entrepreneurial activities at ASU.

Student Success

Our graduates are in very high demand and nearly everyone has an employment opportunity at the time of graduation. Some of our international students would prefer a US placement but this is not always achieved.

Best Practices

Our professional student advising operation is world-class.

APPENDIX A: STUDENT PLACEMENT INFORMATION –SAMPLE

Provided by	The graduate	College	Initial Placement after Graduation		
Fall 2020	Kiraneswar Muthuseenu	Dr. Hugh Barnaby	R&D Device Reliability Engineer	Micron	
Fall 2020	Mehmet Balaban	Dr. Michael Kozicki	Emerging Memory Process Integration Engineer	Micron	

Graduate Student Satisfaction Survey

Table 7: Graduate Student Satisfaction Survey Quality:

Percent of graduating graduate students who responded 'effectively' *or* 'very effectively' or responded 'strong' *or* 'very strong' when asked about their training in the following areas.

Area	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Preparation for further study in your field	87%	89%	89%	91%	92%	92%	TBD
Research skills and methods	70%	75%	70%	67%	72%	73%	TBD
Communication skills	54%	57%	54%	54%	62%	50%	TBD
Knowledge of computer applications in your field	78%	80%	69%	72%	81%	76%	TBD
Writing skills	63%	64%	62%	61%	64%	58%	TBD
Ethical standards in the field	73%	75%	75%	75%	81%	80%	TBD
Quantitative skills	77%	82%	77%	73%	79%	77%	TBD

Table 8: Graduate Student Satisfaction Survey Quality:

Percent of graduating graduate students who responded 'satisfied' or 'very satisfied' with each of the following aspects of your department or program?

Aspect	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Overall academic experience in your major	86%	88%	91%	91%	94%	92%	TBD
Quality of instruction	81%	76%	80%	87%	94%	88%	TBD
Availability of required courses	84%	83%	91%	82%	92%	88%	TBD
Advising on career options within your field	67%	54%	67%	70%	75%	71%	TBD
Concern of faculty for individual students	74%	81%	82%	81%	85%	79%	TBD

Graduate Student Satisfaction Survey Analysis: Identify areas where improvement is necessary and discuss strategic steps to improve student satisfaction in learning and academic experiences.

The student satisfaction exceeds 70% for everything except the communication and writing skills. We have addressed the latter of these via a one credit our technical writing class that focuses on how to write a journal paper or conference paper. For the more general communications skills we provide opportunities for student to present on campus at seminars. Prior to the pandemic we prioritized travel funds for students to present their work at conferences. We anticipate returning to that practice but will also leverage lessons learned during the explosion of virtual presentations in the last two years.

Strategic Graduate Directions

Please discuss future directions/strategic initiatives of your graduate program(s). List any degrees, concentrations, and/or certificates that you plan to launch in the next two years.

We have proposed graduate degrees and concentrations in data science.

V. Student Learning Outcomes Assessment (Undergraduate and Graduate)

In this section: Assessing Student Learning Outcomes UOEEE works with programs in a two-phase process to help programs prepare for self-study: evaluate past data and prepare for future assessment of student learning.

PART ONE: Analyzing Past Assessment Data

To help programs gather past data, the UOEEE assessment portal (https://uoeee.asu.edu/aportal) has developed a new feature that allows programs to access aggregated data as well as download past assessment reports. To help guide data

interpretations, programs are asked to respond to the five prompts provided below as part of their analysis. These prompts should help you establish how well students are achieving the established learning outcomes. This outcome is essential to the assessment process.

Please address each program learning outcomes (PLOs) using these reflective questions as a guide:

Reflective Questions
1. Please discuss the results of your quantitative and qualitative assessment data for each outcome and measure.
2. Are your students achieving at the levels of performance you had expected? How well did they meet your performance criteria?
3. What plans do you have in place for students who are not achieving the desired level of performance?
4. What actions have you taken or will you take based on your assessment data?
5. How will the results be shared with program faculty and students?

The assessment process for ECEE uses the data collected every semester as part of the two-loop ABET assessment and feedback process. This process involves the assessment of student outcomes in multiple areas of interest, including basic knowledge in Math, Sciences, and Engineering; ability to design experiments, collect and interpret data, ability to communicate effectively, work in teams, recognize ethical and professional responsibilities in a variety of contexts. There are multiple assessment points in critical courses (3xx Pathways and select 4xx technical electives) that cover the key areas of Electrical Engineering and, more importantly, provide directions for improvement. In a high-level description, the Student Outcomes are assessed by the students answering technical questions (for the more detailed aspects) and by instructors/teaching assistants evaluating student performance with rubric questionnaires (for the higher-level outcomes). This information is then aggregated and used to suggest feedback actions to improve the student performance according to the selected Student Outcomes. This entire process is driven by (1) a bi-annual review of the program objectives by the External Advisory Board (EAB) that evaluates the program using, among others, the student performance as professionals, as well as (2) yearly faculty meetings that (among others) discuss the past assessments and the implementation of the feedback actions. The results from these meetings provide a high-level direction for the need to modify the targets of the Student Outcomes.

The latest EAB meetings (2018, 2019) identified no deficiencies in the program.

The yearly assessment cycles show that most of the demand for feedback corrections is concentrated in the development of better Math and Engineering skills in the early courses (2xx, 3xx). This expected since Electrical Engineering (and, in particular, the areas related to Electromagnetics, Circuits, and Communications) are math-intensive while, at the same time, require engineering insight to analyze the problems in manner that is relevant to practical applications. The encouraging observation here is that the need for corrective actions decreases in the senior years, showing that the program succeeds in its educational objectives. This is also consistent with the results from the EAB meetings.

1. Discussion of Results.

For Outcome 1: "Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics," the last four semester assessments yielded scores 92%, 86%, 96%, 82%, with a target of 70%, set by the faculty.

For Outcome 2: "Ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors," the last four semester assessments yielded scores 87%, 83%, 98%, 81%, with a target of 70%, set by the faculty.

For Outcome 3: "Ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions," the last four semester assessments yielded scores 77%, 95%, 85%, 81%, with a target of 70%, set by the faculty.

For Outcome 4: "Ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts; ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives," the last four semester assessments yielded scores 81%, 94%, 79%, 82%, with a target of 70%, set by the faculty.

2. Meeting the performance criteria

As shown above, at the senior level, the students achieve a high level of performance and meet the expectations.

3. Plans for students

The Outcome 1-4 evaluation concerns the class average rather than individual students and its objective is to identify areas of the program that may need improvement. Individual students are judged by their class grades. In case of a failing grade, students can discuss options with a advisors and faculty in the area of interest.

4. Actions for improvement

Lab improvements to enhance the engineering skills of the students. Refinement of the assessment process to automate the collection of results. Refinement of specific courses (120, 202, 459, 460). Multimedia lecture Modules and On-line Course development to increase the flexibility of the education process.

5.Dissemination

The assessment results are discussed first in detail within the Undergraduate Committee, having representatives of all ECEE areas. They are then summarized and discussed with the faculty during faculty meetings.

- It is also recommended that programs utilize data from the various student report cards, First Destination (Formerly Recent Graduate) survey, and alumni surveys to address career placement outcomes, career preparation, and who is employing graduates over the period since the last review.

PART TWO: Preparing for the next cycle

A. Programs will begin to prepare for APR the year before their actual review. By the start of the academic year prior to the review, UOEEE will have reviewed each program's assessment plan and provided feedback so the plan comes into compliance with the ABOR requirements. All programs are then asked to review the feedback and make the necessary adjustments to meet the current needs of their program as well as the current suggested criteria established by ABOR. Each assessment plan must be approved by UOEEE through the portal prior to submitting the final Academic Program Review to apr@asu.edu.

The assessment plan has been submitted to UOEEE and it is currently undergoing discussions and revisions for the final approval, which is expected in January 2022.

VI. Faculty

Table 9: Faculty Profile

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	College 2020-21
Tenured / Tenure Track faculty headcount	61	66	69	71	71	72	71	
Total degrees awarded per T/TT faculty Headcount								
% Women Tenured/Tenure Track Faculty	21.3%	21.2%	23.2%	23.9%	25.4%	25%	23.9%	
% Minority Tenured/Tenure Track Faculty	39.3%	36.4%	40.6%	42.3%	43.7%	43.1%	42.3%	
Total Faculty Headcount	72	77	83	84	86	88	87	
Tenured / Tenure track Faculty FTE	61	66	68	71	70.6	71.6	71	
Total Faculty FTE	67.2	73.6	78	80.5	81.9	82.7	83.2	
Student FTE/Faculty FTE ratio								
Staff FTE	51.4	61.1	66.1	67.8	79.1	79.6	83.6	
RA/TA FTE	134	122.5	126.3	137.8	141.6	152.6	119.8	

Table 10: Faculty Areas of Expertise

Please expand table as needed.

Faculty name	Title and Rank	Highest degree attained	List name of courses taught during the last academic year	Areas of scholarly work and research (please include titles and amount of funding for any funded research during the last two years)

| Name | Rank | FT or PT | Highest Degree | Institution from which Highest Degree Earned & Year | Years of Experience | | | State in | Level of Activity (high, med, low, none) | | |
					Govt./ Industry Practice	Total Faculty	This Institution		Professional Society (Indicate S4ociety)	Reaserch	Consulting/Summer Work in Industry
Aberle, James T.	Associate	FT	PhD	U of MA, 1989	5	26	26		IEEE Low	Low	Low
Alkhateeb, Ahmed	Assistant	FT	PhD	UT Austin 2012	0	4	4				
Allee, David	Professor	FT	PhD	Stanford, 1990	1	24	24		IEEE Med	High	Med
Ayyanar, Rajapandian	Professor	FT	PhD	U of MN, 2000	4	14	14		IEEE Low	High	Low
Bakkaloglu, Bertan	Professor	FT	PhD	Oregon State, 1995	2	11	11		IEEE, Med	High	Low
Barnaby, Hugh	Professor	FT	PhD	Vanderbilt, 2002	0	11	11		IEEE Low	High	Med
Bertoni, Mariana	Associate	FT	PhD	Northwestern, 2007	11	8	4		IEEE Med	High	Low
Blain Christen, Jennifer	Associate	FT	PhD	John Hopkins, 2006	0	16	12		IEEE Med	Med	Low
Bliss, Daniel	Professor	FT	PhD	U Calif, 1997	24	10	10		IEEE Med	High	Low
Brunhaver, John	Assistant	FT	PhD	Stanford, 2015	7	6	6		IEEE, Med ACM, Med	Med	Low
Cao, Yu	Professor	FT	PhD	U Calif, 2002	½	11	11		IEEE, Med	High	Low
Chakrabarti, Chaitali	Professor	FT	PhD	U of MD, 1990	1	25	25		IEEE, Med	High	Low
Chickamenahalli, Shamala	Prof. of Pract.	FT	PhD	U of Kentucky 1995	0	6	6		Med	Low	Low
Dasarathy, Gautam	Assistant	FT	PhD	U of WI Madison 2014	0	3	3		Med	High	Low
Ewaisha, Ahmed	Lecturer	FT	PhD	ASU 2016	0	4	4		Med	Med	Low
Faghih Imani, Mohammadreza	Assistant	FT	PhD	UMich 2013	0	1	1		Med	High	Low

Fan, Deliang	Assistant	FT	PhD	Purdue U 2015	0	6	2		Med	High	Low
Fan, Zhaoyang	Professor	FT	PhD	NWU 2001	0	12	1		Med	High	Low
Goodnick, Stephen	Professor	FT	PhD	Colorado State, 1983	1	35	25		IEEE, Med	High	Low
Goryll, Michael	Associate	FT	PhD	RWTH Aachen, 2000	0	14	14		IEEE, Med	Med	Low
Hartin, Olin	Prof. of Pract.	FT	PhD	U of TX 1998	0	6	6		Med	Med	Low
Hedman, Kory	Professor	FT	PhD	U of Calif, 2010	3	10	10		IEEE Med	High	Low
Hedman, Mojdeh	Assistant	FT	PhD	ASU 2017	0	4	4		Med	High	Low
Holbert, Keith E.	Associate	FT	PhD.	U of TN, 1989	7	32	32	AZ	IEEE, Med	Med	Low
Holman, Zachary	Associate	FT	PhD	U of Minn, 2010	0	9	9		IEEE Med	High	Low
Honsberg, Christiana	Professor	FT	PhD	U Delaware, 1992	0	32	18		IEEE Med	High	Low
Hwa, Yoon	Assistant	FT	PhD	Seoul Ntl. U 2013	0	1	1		Med	High	Low
Kiaei, Sayfe	Professor	FT	PhD	WA State, 1987	18	35	20		IEEE; Med	High	Med
King, Richard	Professor	FT	PhD	Stanford 1990	0	6	6		Med	High	Low
Kitchen, Jennifer	Associate	FT	PhD	ASU, 2007	10	10	10		IEEE Med	High	Low
Kosut, Oliver	Associate	FT	PhD	Cornell, 2010	0	12	10		IEEE Med	High	Low
Kozicki, Michael	Professor	FT	PhD	U of Edinburgh,1985	2	35	35	UK	IEEE, Med	high	High
Lai, Ying-Cheng	Professor	FT	PhD	U of MD, 1992	0	27	22		IEEE,APS Med	High	Med
Lei, Qin	Assistant	FT	PhD	Mich SU 2012	0	5	5		Med	High	Low

Meldrum, Deirdre	Professor	FT	PhD	Stanford 1993	0	29	14		Med	High	Med
Michelusi, Nicolo	Assistant	FT	PhD	U of Padova, Italy 2013	0	1	1		Med	High	Low
Millman, Steven	Prof of Pract.	PT	PhD	Stanford 1990	0	3	3		Med	Low	Low
Nedich, Angelia	Professor	FT	PhD	Moscow SU 1994 MIT 2002	0	15	5		Med	High	Low
Nguyen, Duong	Assistant	FT	PhD	Univ. BC 2020	0	1	1		Med	High	Low
Ning, Cun-Zheng	Professor	FT	PhD	U Stuttgart, 1991	9	15	15		IEEE, High	High	Med

Faculty Member (name)		Classes Taught (Course No./Credit Hrs.) Term and Year	Teaching	Research or Scholarship	Other
James Aberle		Senior Design Laboratory I, EEE 488, 3cr, SP21	20	60	20
		Microwave Circuit Design, EEE 545, 3cr, SP21			
		Engineering Electromagnetics, EEE 341, 4cr, FA20			
		Microwaves, EEE 445, 4cr, FA20			
		Senior Design Laboratory II, EEE 489, 3cr, FA20			
Glen Abousleman		Digital Image&Video Proc & Cmp, EEE 508, 4cr, FA20	100	0	0
Ahmed Alkhateeb		Digital Systems and Circuits, EEE 425, 4cr, SP21	45	45	10
		Signals and Systems I, EEE 203, 3cr, FA20			
David Allee		Engineering Electromagnetics, EEE 341, 4cr, SP21	40	40	20
		Circuits II, EEE 334, 4cr, FA20			
		Analog Integrated Circuits, EEE 433, 4cr, FA20			
		The ASU Experience, ASU 101-EEE, 1cr, FA20			
Raja Ayyanar		Special Topics, EEE 598, 3cr, SP21	40	40	20

		Advanced Power Electronics, EEE 572, 3cr, FA20	45	45	10
Bertan Bakkaloglu		Adv Analog Integrated Circuits, EEE 523, 4cr, SP21			
		Adv Analog Integrated Circuits, EEE 523, 4cr, FA20			
Hugh Barnaby		Analog and Digital Circuits, EEE 335, 4cr, SP21	45	45	10
		Circuits II, EEE 334, 4cr, FA20			
Alicia Baumann		Digital Design Fundamentals, EEE 120, 3cr, SP21	100	0	0
		The ASU Experience, ASU 101-EEE, 1cr, SP21			
Visar Berisha		Signals and Systems I, EEE 203, 3cr, SP21	45	45	10
		Special Topics, EEE 598, 3cr, FA20			
Daniel Bliss		Communication Systems, EEE 455, 4cr, SP21	45	45	10
		Communication Systems, EEE 455, 4cr, FA20			
John Brunhaver		Pro-Seminar, EEE 498, 4cr, SP21	45	45	10
		Pro-Seminar, EEE 498, 4cr, FA20			
Yu Cao		Digital Systems and Circuits, EEE 425, 4cr, SP21	45	45	10
		VLSI Design, EEE 525, 4cr, SP21			
		Special Topics, EEE 598, 3cr, FA20			
Chaitali Chakrabarti		Digital Systems and Circuits, EEE 425, 4cr, SP21	45	45	10
		Signals and Systems II, EEE 304, 4cr, FA20			
Shamala Chickamenahalli		Circuits I, EEE 202, 4cr, SP21	100	0	0
		Energy Sys/Power Electronics, EEE 360, 4cr, SP21			
		Circuits I, EEE 202, 4cr, FA20			
		Circuits II, EEE 334, 4cr, FA20			
Gautam Dasarathy		Special Topics, EEE 598, 3cr, SP21	40	40	20
		Special Topics, EEE 598, 3cr, FA20			
Ahmed Ewaisha		Circuits I, EEE 202, 4cr, SP21	100	0	0
		Digital Design Fundamentals, EEE 120, 3cr, SP21			
		Fundamentals Electromagnetics, EEE 241, 3cr, SP21			
		Circuits I, EEE 202, 4cr, FA20			
		Digital Design Fundamentals, EEE 120, 3cr, FA20			
		Fundamentals Electromagnetics, EEE 241, 3cr, FA20			

Seyedmohammadreza Faghih Imani	Fundamentals Electromagnetics, EEE 241, 3cr, SP21	40	40	20
	Fundamentals Electromagnetics, EEE 241, 3cr, FA20			
Deliang Fan	Circuits II, EEE 334, 4cr, SP21	40	40	20
Zhaoyang Fan	Fundamentals Electromagnetics, EEE 241, 3cr, SP21	40	40	20
	Circuits I, EEE 202, 4cr, FA20			
	Digital Systems and Circuits, EEE 425, 4cr, FA20			
Gabriele Formicone	Circuits I, EEE 202, 4cr, SP21	100	0	0
Douglas Garrity	Analog to Digital Converters, EEE 527, 4cr, SP21	100	0	0
Stephen Goodnick	Fund of Solid-State Devices, EEE 436, 3cr, SP21	40	40	20
	Pro-Seminar, EEE 498, 3cr, FA20			
Michael Goryll	Quantum Mechanics Engineers, EEE 434, 3cr, SP21	40	40	20
	Photovoltaic Energy Conversion, EEE 465, 3cr, SP21			
	Digital Design Fundamentals, EEE 120, 3cr, FA20			
	Quantum Mechanics Engineers, EEE 434, 3cr, FA20			
	The ASU Experience, ASU 101-EEE, 1cr, FA20			
Olin Hartin	Hardwre Design Lang/Prog Logic, EEE 333, 4cr, SP21	45	45	10
	Pro-Seminar, EEE 498, 3cr, SP21			
	Hardwre Design Lang/Prog Logic, EEE 333, 4cr, FA20			
	Circuits II, EEE 334, 4cr, FA20			
	Pro-Seminar, EEE 498, 3cr, FA20			
Mojdeh Hedman	Power System Analysis, EEE 471, 3cr, SP21	40	40	20
Kory Hedman	Special Topics, EEE 598, 3cr, SP21	40	40	20
Mojdeh Hedman	Power Engr Operations/Planning, EEE 577, 3cr, FA20	45	45	10
Keith Holbert	Nuclear Power Engineering, EEE 460, 3cr, SP21			
	Nuclear Rx Dynamics&Diagnostcs, EEE 563, 3cr, SP21			
	Electrical Power Plants, EEE 463, 3cr, FA20			
	Nuclear Reactor Theory&Design, EEE 562, 3cr, FA20			
	Special Topics, EEE 598, 1.5cr, FA20			
Zachary Holman	Special Topics, EEE 598, 1cr, FA20	20	50	30
Yoon Hwa	Digital Design Fundamentals, EEE 120, 3cr, SP21	45	45	10

	Digital Design Fundamentals, EEE 120, 3cr, FA20			
Suren Jayasuriya	Machine Vision and Pattern Rec, EEE 515, 3cr, SP21	45	45	10
	Circuits I, EEE 202, 4cr, FA20			
Sayfe Kiaei	Analog Integrated Circuits, EEE 433, 4cr, SP21	20	50	30
	Special Topics, EEE 598, 4cr, FA20			
Richard King	Special Topics, EEE 598, 3cr, SP21	40	40	20
	Solar Cells, EEE 565, 3cr, FA20			
	Solar Cells, EEE 565, 3cr, FA20			
Jennifer Kitchen	Analog and Digital Circuits, EEE 335, 4cr, SP21	45	45	10
	Analog and Digital Circuits, EEE 335, 4cr, FA20			
Oliver Kosut	Signals and Systems I, EEE 203, 3cr, SP21	45	45	10
	Random Signal Theory, EEE 554, 3cr, FA20			
Michael Kozicki	Senior Design Laboratory II, EEE 489, 3cr, SP21	40	50	10
	Advanced Silicon Processing, EEE 530, 3cr, SP21			
	Semiconduct Facil/Cleanrm Prac, EEE 439, 3cr, FA20			
	Senior Design Laboratory I, EEE 488, 3cr, FA20			
	The ASU Experience, ASU 101-EEE, 1cr, FA20			
Ying-Cheng Lai	Random Signal Theory, EEE 554, 3cr, SP21	10	70	20
	Special Topics, EEE 598, 3cr, FA20			
Qin Lei	Power System Transients, EEE 571, 3cr, SP21	45	45	10
	Power Electronics & Power Mgmt, EEE 472, 3cr, FA20			
Robert LiKamWa	Special Topics, EEE 598, 3cr, FA20	45	45	10
Christopher Mar	Computer Org/Assemb Lang Prog, EEE 230, 3cr, SP21			
	Computer Org/Assemb Lang Prog, EEE 230, 3cr, FA20			
Bassam Matar	Digital Design Fundamentals, EEE 120, 3cr, SP21	100	0	0
	Digital Design Fundamentals, EEE 120, 3cr, FA20			
Alexander Maurer	Digital Design Fundamentals, EEE 120, 3cr, FA20			
Deirdre Meldrum	Signals and Systems I, EEE 203, 3cr, SP21	20	60	20
	Circuits I, EEE 202, 4cr, FA20			

Nicolo Michelusi	Digital Design Fundamentals, EEE 120, 3cr, SP21			
Steven Millman	Digital Design Fundamentals, EEE 120, 3cr, SP21	100	0	0
	Pro-Seminar, EEE 498, 3cr, SP21			
	Digital Design Fundamentals, EEE 120, 3cr, FA20			
	Seminar, EEE 591, 3cr, FA20			
	The ASU Experience, ASU 101-EEE, 1cr, FA20			
Bahman Moraffah	Digital Design Fundamentals, EEE 120, 3cr, FA20			
	The ASU Experience, ASU 101-EEE, 1cr, FA20			
Mutsumi Nakamura	Computer Org/Assemb Lang Prog, EEE 230, 3cr, SP21			
	Computer Org/Assemb Lang Prog, EEE 230, 3cr, FA20			
Angelia Nedich	Random Signal Analysis, EEE 350, 3cr, SP21	40	40	20
	Linear Algebra & Cnvx Opt, EEE 589, 3cr, SP21			
	Random Signal Analysis, EEE 350, 3cr, FA20			
	Special Topics, EEE 598, 3cr, FA20			
Duong Nguyen	Special Topics, EEE 598, 3cr, SP21			
Cun-Zheng Ning	Fundamentals Electromagnetics, EEE 241, 3cr, SP21	40	40	20
Sule Ozev	Circuits II, EEE 334, 4cr, SP21	45	45	10
	Digital Systems and Circuits, EEE 425, 4cr, FA20			
Anamitra Pal	Power Transmission/Distributn, EEE 579, 3cr, SP21	40	40	20
	Energy Sys/Power Electronics, EEE 360, 4cr, FA20			
Joseph Palais	Coherent Optics, EEE 548, 3cr, SP21	25	25	50
	Internship, EEE 584, 1cr, SP21			
	Fiber Optics, EEE 448, 3cr, FA20			
	Internship, EEE 584, 1cr, FA20			
George Pan	Antennas Wireless Communicatns, EEE 443, 3cr, SP21	45	45	10
	Adv Electromagnet Field Theory, EEE 641, 3cr, SP21			
	Engineering Electromagnetics, EEE 341, 4cr, FA20			
	Fundamentals Electromagnetics, EEE 241, 3cr, FA20			

Instructor	Course			
Antonia Papandreou-Suppappola	Time-Frequency Signal Process, EEE 505, 3cr, SP21	55	35	10
	Detection/Estimation Theory, EEE 556, 3cr, SP21			
	Random Signal Theory, EEE 554, 3cr, FA20			
Stephen Phillips	The ASU Experience, ASU 101-EEE, 1cr, SP21	20	30	50
	The ASU Experience, ASU 101-EEE, 1cr, FA20			
Lesley Polka	Electromag Fields/Guided Waves, EEE 541, 3cr, FA20			
Jiangchao Qin	Electric Power Quality, EEE 573, 3cr, FA20	40	40	20
	Electric Power Quality, EEE 573, 3cr, FA20			
Sangram Redkar	Internship, EEE 584, 1cr, SP21			
	Internship, EEE 584, 1cr, FA20			
Martin Reisslein	Communication Networks, EEE 459, 3cr, SP21	30	40	30
	The ASU Experience, ASU 101-EEE, 1cr, SP21			
	Digital Design Fundamentals, EEE 120, 3cr, FA20			
	Communication Networks, EEE 459, 3cr, FA20			
	The ASU Experience, ASU 101-EEE, 1cr, FA20			
Christ Richmond	Information Theory, EEE 551, 3cr, SP21	45	45	10
	Signals and Systems I, EEE 203, 3cr, FA20			
Armando Rodriguez	Circuits I, EEE 202, 4cr, SP21	40	40	20
	Feedback Systems, EEE 480, 4cr, SP21			
	Feedback Systems, EEE 480, 4cr, FA20			
	Design Multivari Control Sys, EEE 588, 3cr, FA20			
Ivan Sanchez Esqueda	Semiconductor Device Theory I, EEE 531, 3cr, SP21	40	40	20
	Fundamentals Electromagnetics, EEE 241, 3cr, FA20			
Lalitha Sankar	Pro-Seminar, EEE 498, 4cr, FA20	45	45	10
Anna Scaglione	Special Topics, EEE 598, 3cr, SP21	40	40	20
Jae-sun Seo	Special Topics, EEE 598, 3cr, SP21			
	VLSI Design, EEE 525, 4cr, FA20			
Md Ashfaque Shafique	Computer-Controlled Systems, EEE 481, 4cr, SP21	100	0	0
	Computer-Controlled Systems, EEE 481, 4cr, FA20			
Jennie Si	Artificial Neural Computation, EEE 511, 3cr, SP21	20	60	20

		Optimal Control, EEE 587, 3cr, SP21			
		Digital Design Fundamentals, EEE 120, 3cr, FA20			
		Artificial Neural Computation, EEE 511, 3cr, FA20			
Brian Skromme		Circuits I, EEE 202, 4cr, SP21	35	35	30
		Circuits I, EEE 202, 4cr, FA20			
		Properties Electronic Material, EEE 352, 4cr, FA20			
Hongjiang Song		Special Topics, EEE 598, 3cr, SP21	100	0	0
		Special Topics, EEE 598, 3cr, FA20			
Andreas Spanias		Digital Signal Processing, EEE 407, 4cr, SP21	40	40	20
		Digital Signal Processing, EEE 407, 4cr, FA20			
		Adaptive Signal Processing, EEE 606, 3cr, FA20			
Meng Tao		Circuits I, EEE 202, 4cr, SP21	40	40	20
		Properties Electronic Material, EEE 352, 4cr, SP21			
		Properties Electronic Material, EEE 352, 4cr, FA20			
Cihan Tepedelenlioglu		Signals and Systems II, EEE 304, 4cr, SP21	40	40	20
		Random Signal Analysis, EEE 350, 3cr, SP21			
		Circuits I, EEE 202, 4cr, FA20			
		Random Signal Analysis, EEE 350, 3cr, FA20			
Trevor Thornton		Semiconductor Characterization, EEE 536, 3cr, SP21	25	25	50
		Fundamentals of CMOS & MEMS, EEE 435, 3cr, FA20			
Georgios Trichopoulos		Engineering Electromagnetics, EEE 341, 4cr, SP21	45	45	10
		Special Topics, EEE 598, 3cr, SP21			
		Antenna Analysis and Design, EEE 543, 3cr, FA20			
Konstantinos Tsakalis		Signals and Systems II, EEE 304, 4cr, SP21	40	40	20
		Nonlinear Control Systems, EEE 586, 3cr, SP21			
		Internship, EEE 484, 1cr, SP21			
		Signals and Systems II, EEE 304, 4cr, FA20			
		Linear System Theory, EEE 582, 3cr, FA20			
		Internship, EEE 484, 1cr, FA20			
Dragica Vasileska		Circuits I, EEE 202, 4cr, SP21	45	45	10

		Digital Design Fundamentals, EEE 120, 3cr, SP21			
		Circuits I, EEE 202, 4cr, FA20			
		Semiconduct Process/Device Sim, EEE 533, 4cr, FA20			
Vijay Vittal		Power System Stability, EEE 575, 3cr, SP21	40	40	20
		Electric Power Devices, EEE 470, 3cr, FA20			
Sarma Vrudhula		Computer Org/Assemb Lang Prog, EEE 230, 3cr, SP21			
Chao Wang (1)		Real-Time DSP Systems, EEE 404, 4cr, SP21	100	0	0
		Fund of Solid-State Devices, EEE 436, 3cr, FA20			
		Special Topics, EEE 598, 3cr, SP21			
Chao Wang (2)		Signals and Systems I, EEE 203, 3cr, FA20	40	40	20
		The ASU Experience, ASU 101-EEE, 1cr, FA20			
		Signals and Systems I, EEE 203, 3cr, SP21			
		Signals and Systems I, EEE 203, 3cr, SP21			
Yang Weng		Energy Sys/Power Electronics, EEE 360, 4cr, FA20	45	45	10
Marnie Wong		Circuits I, EEE 202, 4cr, SP21	100	0	0
		Circuits I, EEE 202, 4cr, FA20			
Meng Wu		Energy Sys/Power Electronics, EEE 360, 4cr, SP21	45	45	10
		Electric Power Devices, EEE 470, 3cr, FA20			
Yu Yao		Circuits I, EEE 202, 4cr, FA20	45	45	10
Hongbin Yu		Special Topics, EEE 598, 3cr, SP21	45	45	10
		Circuits I, EEE 202, 4cr, FA20			
		Special Topics, EEE 598, 3cr, FA20			
Saeed Zeinolabedinzadeh		Comm Transceiver Circuit Desgn, EEE 524, 4cr, SP21	45	45	10
		Analog and Digital Circuits, EEE 335, 4cr, FA20			
		Analog Integrated Circuits, EEE 433, 4cr, FA20			
Junshan Zhang		Random Signal Theory, EEE 554, 3cr, SP21	20	60	20
Yanchao Zhang		Wireless Networks, EEE 559, 3cr, SP21	45	45	10
		Broadband Networks, EEE 557, 3cr, FA20			
Yong-Hang Zhang		Semiconductor Optoelectronics, EEE 537, 3cr, FA20	40	40	20
		Properties Electronic Material, EEE 352, 4cr, SP21			

Yuji Zhao		Fund of Solid-State Devices, EEE 436, 3cr, SP21	45	45	10

Faculty Analysis

1. What is the career stage distribution and diversity of the faculty in the unit?

   There is a relatively healthy distribution across ranks and seniority. 45% full professors 20% associate professors and 35% assistant professors. 22% identify as female and hiring in this group remains a high priority.

2. What is the quality of the intellectual life in the unit? Are there regular and frequent opportunities for speakers, graduate student presentations, etc.? What other examples might there be of the intellectual life of the department or school?

   The pandemic has limited the amount of face-to-face engagement. But we have had a vibrant virtual speakers series including many faculty candidates. A handful of these have been in-person.

3. Discuss faculty recruitment and retention. What significant faculty hires have occurred since the last program review? What significant faculty departures have occurred since the last program review? What is the faculty record in recruiting and retaining high achieving colleagues?

   Faculty hiring has been quite robust with 6 hires starting in 2021-22, 5 in 2019-20, 2 in 2018-19, 2 in 2017-18 and 5 in 2016-17, 4 in 2015-16 and 5 in 2014-15, a total of 29 in the past 7 years. There have been a modest number of departures including 3 deaths, 3 retirements, 2 prior-to-tenure departures and 4 tenured departures, a total of 12 over the past 7 years.

4. What are the prospects for recruiting future faculty?

   The New Economy Initiative investments promises to sustain faculty hiring prospects for the next few years.

5. What are your goals for future?

   Goal is to maintain current rate of hiring and minimize departures.

6. How do these goals reflect the following:

   - faculty inclusion and success,   -- we place a high priority on hiring those who identify as female as well as those who identify as a member of an under-represented minority group.
   - serving diverse students,   --- we place a priority on faculty candidates who commit to specific outreach and recruitment of diverse students.
   - public value research? -- Our fields of research map well to public-value research. Our faculty candidates make public research presentations as part of the interview process.

7. What is your process for fairly assigning faculty workload, including teaching, committee work and mentoring? Are the process and workload assignments transparent to faculty? How does your unit recognize these contributions? Do underrepresented faculty take on a disproportionate amount of committee work and mentoring? Do workload assignments reflect relative

contributions – that is, do those who do high quality and high-volume research teach the same as others who are less research active?

        The director of the school assigns workload with input from faculty peer groups. In practice the peer groups make recommendations and the director modulates these recommendations to meet the needs of the unit. Faculty can appeal decisions to the dean's office. Faculty teaching assignments take into account the faculty members' research activity. Committee assignments are most often made based on faculty who volunteer for these roles.

        Evaluations begin with recommendations from the elected faculty peer committee. This includes scores for research, teaching and service. Those recommendations are combined with the director's recommendation for the final evaluation. Faculty can appeal to the dean's office.

8. What is the process for mentoring and supporting faculty? What efforts are made to assist assistant professors working toward promotion to tenure? What efforts are made to assist associate professors working toward promotion to full professor? How do those efforts and/or resources address the needs of underrepresented faculty?

Several coordinated initiatives and entities within the Fulton Schools of Engineering (FSE) support the career development of assistant and associate professors. A New Faculty Advisory Council (NFAC) has been active for more than 5 years to advise the dean about issues of relevance for newly hired faculty members and to organize peer-mentoring activities for the group. Within each academic unit, a few master mentors are chosen among the most successful faculty members to provide a personalized mentoring experience for junior and mid-career colleagues. At the college level, annual workshops are held to discuss best practices for teaching, research organization, project management, and laboratory safety. A new Engineering Learning and Teaching Hub has also been formed to provide additional guidance and training for faculty teaching in both full immersion and online modes. For research, we also provide CAREER proposal workshops and research team support.

Annual workshops are organized to describe the process of evaluation of the promotion and/or tenure applications. These are important for the optimization of the career path of the candidates, and to express the transparency of the evaluation process.

A college-level council is being introduced to address climate and culture in order to enhance diversity equity and inclusion, and expand access to the related resources across the schools. The council is being institutionalized in the college bylaws to help the FSE realize its vision to embed inclusivity as a core tenet of the college so that all faculty, staff, academic associates and students achieve their full potential enabled by an environment that is diverse, equitable and inclusive.

9. Are fixed term faculty members used and if so, are they deployed effectively in the department/school? What is the breakdown of their diversity, what is their career progression and how are they mentored?

        We have 3 professors of practice, one who identifies as female. These are senior professionals who have retired from industry. We have one lecturer who is a recent PhD graduate from our progarm.

10. What efforts are made to ensure the ongoing professional development of non-tenure track faculty members?

        We encourage professional development internally through various teaching initiatives at

the college and university levels. We also encourage participating at conferences and, when appropriate, provide travel and registration funds.

11. Do your faculty members and staff have a clear and fair process for discussing a grievance with another professor or department administrator? (Discriminatory practices, bullying, sexual harassment) Are faculty making use of it?

The process is clearly stated in the university's internal regulation. Among others, two offices play a critical role in the implementation of a healthy workplace: the Office of Diversity, Equity and Inclusion supports and fosters a culture of inclusiveness. They promote and assist with equal opportunity and diversity initiatives. They also provide university leadership and hiring officials with clear and accessible employment data, timely and effective consultation, and high-impact training.

Additionally, the Office of University Rights and Responsibility has been established as an independent entity that reviews and investigates concerns and allegations regarding discrimination or harassment. FSE has a Vice Dean specific to Faculty Affairs that assists in guiding faculty with these types of grievances.

Scholarship

1. Discuss the depth and quality of faculty scholarship. Is the Department/School's quality improving relative to the top-rated programs in the discipline?

    Our strong graduate program ranking is due, in large part, the high level of recognition of the scholarly accomplishments of our faculty.

2. What factors contribute to the department/school's program reputation? How does the unit wish to be viewed by others?

    Recognition by faculty peers is the strongest component of our reputation. Faculty participation in important conferences and publishing in premier journals drive this reputation.

3. What is the standing of the department or school in the context of external rankings such as those from NRC or other appropriate sources?

    We are generally ranked in the top 10% of US programs.

4. How adaptable has the department/school been/not been to changes in the discipline or field of study?

    In many cases our faculty are driving many of the changes in their fields.

5. Do the scholarship and course offerings reflect the diversity of the student body and ASU's commitment to public value research? Do they reflect the changing demographics of the United States? How might the scholarship and offered courses affect research opportunities and student enrollment diversity?

    Our graduate programs are majority international enrolled. A majority of our faculty also have significant international background and experience. This is unlikely to change in the near term. We have made investments to increase our recruitment efforts in the US. A recent initiative at the college level is summer research internships at ASU for student from HBCU institutions.

6. Please discuss any new faculty hires that relate to any new curricular and strategic directions (e.g., new programs, research initiatives etc.)

We have hired strongly in Machine Learning, Quantum Information and Cyber-physical Systems in the past 3 years.

7. What is the success of the faculty in competitions for external awards, grants, and fellowships?

Our faculty are strongly represented in these areas.

8. What is the success of the faculty in attracting high quality graduate students?

At the Masters level we do very well. At the PhD level we face challenges. Please see the section on student recruitment for more details.

9. What is the success of undergraduate or master's students in terms of their career or graduate school objectives? What is the placement rate for graduate students?

Our students are in very high demand and almost all have employment opportunities prior to graduation. Please see the section on student success.

VII. Program Resources

- Describe sufficiency of resources related to technology, physical space, fiscal budgets, library, and human resources.

  While we have a process to renovate and build research labs for new hires, the challenges with readiness of infrastructure have been significant at times. Faculty growth and research are negatively impacted when lab renovations are slow. Similarly, processes established for the procurement of software, while understandable in approach from the perspective of security, have resulted in lengthy delays in some cases in the actual acquisition of the software.

  Teaching and office facilities are adequate. Our academic support staff is excellent and supports the students at all levels. Our staff often lend ideas and expertise to other academic units.

- Describe strategic efforts and accomplishments related to research funding and development activities.

  Our research advancement staff aggressively identifies funding opportunities and works closely with faculty to submit responsive proposals. The school director participates in philanthropic fundraising with staff affiliated with the ASU Foundation.

Appendix A - Sample Programs of Study

1. **Electrical Engineering BSE**

Course (Department, Number, Title) List all courses in the program by term starting with the first term of the first year and ending with the last term of the final year.	Indicate Whether Course is Required, Elective or a Selected Elective by an R, an E or an SE.[1]	Subject Area (Credit Hours)			Last Two Terms the Course was Offered: Year and, Semester, or Quarter	Maximum Section Enrollment for the Last Two Terms the Course was Offered[2]
		Math & Basic Sciences	Engineering Topics Check if Contains Significant Design (√)	Other		

Course	Type	Col3	Col4	Col5	Semester	Enrollment
1st Sem. ASU101 The ASU experience	R			1	FA20, SP21	19, 14
1st Sem. CHM114 General Chemistry for Engineers, OR CHM116 General Chemistry II	SE	4			FA20, SP21	312, 236
1st Sem. CSE100 Principles of Programming with C++	R		3		FA20, SP21	247, 168
1st Sem. FSE100 Introduction to Engineering	R		2, √		FA20, SP21	40, 40
1st Sem. MAT265 Calculus for Engineers I	R	3			FA20, SP21	119, 111
1st Sem. ENG101 and 102 First Year Composition, OR 1st Sem. ENG107 and 108 English for Foreign Students, OR 1st Sem. ENG105 Advanced First Year Composition	SE			3	FA20, SP21	25, 23
2nd Sem. EEE120 Digital Design Fundamentals	R		3		FA20, SP21	72, 75
2nd Sem. HU & C/G/H	E			3	FA20, SP21	445, 447
2nd Sem. MAT266 Calculus for Engineers II	R	3			FA20, SP21	82, 90
2nd Sem. PHY121/122 University Physics I /Laboratory I	R	3/1			FA20, SP21	226, 220
2nd Sem. ENG101 and 102 First Year Composition, OR 2nd Sem. ENG107 and 108 English for Foreign Students, OR 2nd Sem. ENG105 Advanced First Year Composition	SE			3	FA20, SP21	51, 63
3rd Sem. EEE202 Circuits I	R		4		FA20, SP21	50, 50
3rd Sem. MAT267 Calculus for Engineers III	R	3			FA20, SP21	101, 80
3rd Sem. MAT274 Elementary Differential Equations, OR 3rd Sem. MAT275 Modern Differential Equations	SE	3			FA20, SP21	98, 80
3rd Sem. PHY131/132 University Physics II /Laboratory II	R	3/1			FA20, SP21	230, 217
4th Sem. EEE203 Signals and Systems I	R		3		FA20, SP21	72, 70
4th Sem. EEE241 Fundamentals of Electromagnetics	R		3		FA20, SP21	69, 69
4th Sem. MAT342 Linear Algebra, OR	SE	3			FA20, SP21	40, 50

MAT343 Applied Linear Algebra						
4th Sem. PHY241 University Physics III	R	3/1			FA20, SP21	75, 137
4th Sem. HU & C/G/H	E			3	FA20, SP21	445, 447
5th Sem. EEE334 Circuits II	R		4		FA20, SP21	67, 69
5th Sem. EEE350 Random Signal Analysis	R		3		FA20, SP21	68, 79
5th Sem. EEE230 Computer Organization and Assembly Language Programming	R		3		FA20, SP21	173, 195
5th Sem. Area Pathway Course (Choose 4 of EEE 304, 333, 335, 341, 352, 360)	SE		3		FA20, SP21	
6th Sem. ECN211/212 Macroeconomic Principles OR ECN201 Economic Issues and Analysis (SB)	SE			3	FA20, SP21	302, 304
6th Sem. Area Pathway Course (see list below *) (Choose 4 of EEE 304, 333, 335, 341, 352, 360)	SE		4		FA20, SP21	------------
1. EEE 304 Signals and Systems II	SE		4		FA20, SP21	57, 67
2. EEE 333 Hardware Design Language/Programming Logic	SE		4		FA20, SP21	59, 80
3. EEE 335 Analog and Digital Circuits	SE		4		FA20, SP21	68, 93
4. EEE 341 Engineering Electromagnetics	SE		4		FA20, SP21	38, 70
5. EEE 352 Properties of Electronic Materials	SE		4		FA20, SP21	22, 65
6. EEE 360 Electrical Systems/Power Electronics	SE		4		FA20, SP21	58, 68
6th Sem. Area Pathway Course	E		4		FA20, SP21	
6th Sem. Area Pathway Course	E		4		FA20, SP21	
7th Sem. EEE488 Senior Design Laboratory I (L)	R		3, √		FA20, SP21	135, 44
7th Sem. Upper division Math, Science or Engineering elective	E	3	Or 3		FA20, SP21	
7th Sem. SB & C/G/H	E			3	FA20, SP21	400, 400

7th Sem. Technical Elective (15hr, min 2 areas of emphasis, min 2 courses in one area of emphasis)	E		3		FA20, SP21	
7th Sem. Technical Elective	E		3		FA20, SP21	
8th Sem. EEE489 Senior Design Laboratory II (L)	R		3, √		FA20, SP21	78, 133
8th Sem. Upper division HU OR SB	E			3	FA20, SP21	850, 725
8th Sem. Technical Elective (see bullet list below for FA20 options)	E		3		FA20	-----------
7. EEE 407 Digital Signal Processing	E				FA20	37
8. EEE 425 Digital Systems and Circuits	E				FA20	38
9. EEE 433 Analog Integrated Circuits	E				FA20	50
10. EEE 434 Quantum Mechanics for Engineers	E				FA20	35
11. EEE 435 Fundamentals of CMOS and MEMS	E				FA20	20
12. EEE 436 Fundamentals of Solid-State Devices	E				FA20	16
13. EEE 439 Semiconductor Facilities/Cleanroom Practices	E				FA20	27
14. EEE 445 Microwaves	E				FA20	41
15. EEE 448 Fiber Optics	E				FA20	30
16. EEE 455 Communication Systems	E				FA20	29
17. EEE 459 Communication Networks	E				FA20	68
18. EEE 463 Electrical Power Plants	E				FA20	38
19. EEE 470 Electric Power Devices	E				FA20	57
20. EEE 472 Power Electronics and Power Management	E				FA20	63
21. EEE 480 Feedback Systems	E				FA20. SP21	23, 30
22. EEE 481 Computer Controlled Systems	E				FA20	29
8th Sem. Technical Elective (see bullet list below for SP21 options)	E		3		SP21	-----------
23. EEE 404 Real-Time DPS Systems	E				SP21	31
24. EEE 407 Digital Systems Processing	E				SP21	28
25. EEE 425 Digital Systems and Circuits	E				SP21	64
26. EEE 433 Analog Integrated Circuits	E				SP21	69
27. EEE 434 Quantum Mechanics for Engineers	E				SP21	27

Course						
28. EEE 436 Fundamentals of Solid-State Devices	E				SP21	24
29. EEE 443 Analog Integrated Circuits	E				SP21	26
30. EEE 455 Communication Systems	E				SP21	33
31. EEE 459 Communication Networks	E				SP21	82
32. EEE 460 Nuclear Power Engineering	E				SP21	61
33. EEE 465 Photovoltaic Energy Conversion	E				SP21	34
34. EEE 471 Power Systems Analysis	E				SP21	58
35. EEE 481 Computer Controlled Systems	E				SP21	15
Add rows as needed to show all courses in the curriculum.					FA20, SP21	
TOTALS (in terms of semester credit hours)		30	65	25		
Total must satisfy minumum credit hours — Minimum Semester Credit Hours		30 Hours	45 Hours			

- **Required** courses are required of all students in the program, **elective** courses (often referred to as open or free electives) are optional for students, and **selected elective** courses are those for which students must take one or more courses from a specified group.
- For courses that include multiple elements (lecture, laboratory, recitation, etc.), indicate the maximum enrollment in each element. For selected elective courses, indicate the maximum enrollment for each option.

The figure below shows the prerequisite structure of the program

MAT 265 (3) → MAT 266 (3) → MAT 267 (3) →	MAT 342/343 (3)	EEE 350 (3) Pre/co-req 203	Area Pathway course (4)	EEE 488 (3) → EEE 489 (3)
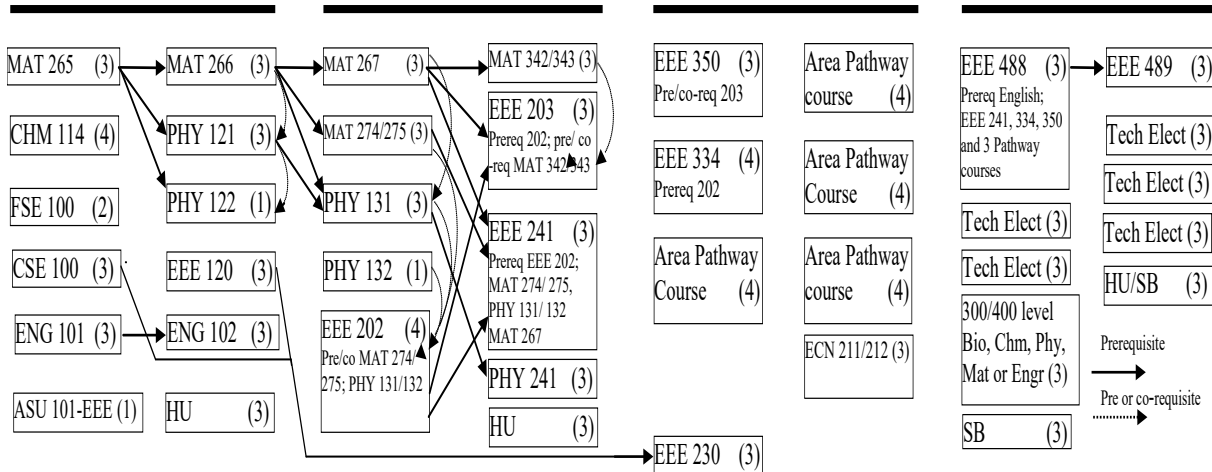
PLAN OF STUDY WORKSHEET

ELECTRICAL ENGINEERING MSE

(non-thesis)

This is a sample plan of study, which meets the degree requirements for the MSE program. Course selection is up to the individual and should be made based on academic and career goals. A complete list of all courses by specialization area may be found here. The list of special topics courses offered every semester may be found here. All students should review the MSE Final Comprehensive Exam description for their area to ensure adequate exam preparation. Students are also responsible for checking course prerequisites to be certain they are prepared for the courses they select.

	Course Number	Course Title	Credits	Semester/Year
1	EEE 591/435	Fundamentals of CMOS and MEMS	3	Fall/1
2	EEE 591/436	Fundamentals of Solid-State Devices	3	Fall/1
3	EEE 537	Fundamentals of Optoelectronics	3	Fall/1
4	EEE 530	Advanced Silicon Processing	3	Spring/1
5	EEE 536	Semiconductor Characterization	3	Spring/1
6	EEE 598	Nanophotonics	3	Spring/1

[Type here]

7	EEE 531	Semiconductor Device Theory I	3	Fall/2	
8	EEE 565	Solar Cells	3	Fall/2	
9	EEE 547	Microwave Solid-State Circuit Design I	3	Fall/2	
10	EEE 528	Introduction to Microelectromechanical Systems	3	Spring/2	

MSE Degree Requirements: At least five EEE courses, at most two 400-level courses, at least three EEE 500- level courses (not EEE 591 or 590), at least two courses outside area of specialization, at most one EEE 590 Reading and Conference or any FSE 500 level course. Total: 10 classes required, 30 credits minimum.

PLAN OF STUDY WORKSHEET

ELECTRICAL ENGINEERING PhD

This is a sample plan of study, which meets the degree requirements for the PHD program. Course selection is up to the individual and should be made based on academic and career goals. A complete list of all courses by specialization area may be found here. The list of special topics courses offered every semester may be found here. Students are also responsible for checking course prerequisites to be certain they are prepared for the courses they select.

Proposed Doctoral Program

18 hours of 500 (or above) level courses. Only one Reading and Conference allowed. At least 9 hours in EEE (does not include Reading and Conference).

	Course	Course Title	Class Hours	Semester Year	Grade
1	EEE 507	Multidimension Signal Process	3	Fall 2014	A
2	EEE 598	Special Topics: Pers Snsr Mobile Health Apps	3	Fall 2014	A
3	EEE 598	Topic: RF Transmitters and Amplifiers	3	Spring 2015	A
4	EEE 581	Filtering Stochastic Processes	3	Spring 2015	A
5	EEE 511	Artificial Neural Computation	3	Fall 2015	A
6	EEE 582	Linear System Theory	3	Fall 2015	A

12 hours research (EEE792) or coursework or omnibus.

7	EEE 505	Time-Frequency Signal Process	3	Fall 2015	A
8	EEE 792	Research	3	Fall 2014	Y
9	EEE 792	Research	3	Spring 2015	Y
10	EEE 792	Research	3	Fall 2015	Y

Research and Dissertation

[Type here]

11	EEE792	Research	12	Spring 2016	Y
12	EEE799	Dissertation	12	Fall 2016	Y
		TOTAL	54		

Special notes-

- GPA must be 3.5 or greater. Research hours are not normally graded
- This example only shows 54 credits. If you have a Master's degree awarded from a US regionally accredited institution or from an international accredited institution, you will be granted 30 credits towards your PHD program here at ASU. That means you only need to complete 54 credits at ASU.
- If you do not have a Master's degree, you will need to complete an additional 30 credits of coursework. The courses that you take here at ASU depend on your area of specialization and what you and your faculty advisor agree upon. For more information on the areas of specialization, please refer to this webpage: http://ecee.engineering.asu.edu/academics/doctoral-degrees/electrical-engineering-ph-d/

PLAN OF STUDY WORKSHEET

COMPUTER ENGINEERING (ELECTRICAL ENGINEERING)

MS Degree (Non-thesis)

This is a sample plan of study, which meets the degree requirements for the Computer Engineering (Electrical Engineering) MS program. Course selection is up to the individual and should be made based on academic and career goals. Students are required to complete the following:

- Core courses: EEE 554 and CSE 551. EEE 554 must be completed in the first semester of study and CSE 551 must be completed in the first year of study.
- Area courses: Complete list of area courses can be found here. Students must select three EEE/CEN area courses and one CSE/CEN area course. Of the four area courses, students need to cover at least two different areas (EX: three courses in the VAES area and one course in the ASR area is acceptable. Not all courses can be from one area).
- Elective courses: Three or four elective courses, depending on the credits needed to graduate and the student's area of interest. Please note that only some 400 level or 591 courses are approved as electives. That list of courses can be found at the bottom of the approved area course list (linked above).

Non-thesis students are expected to complete the comprehensive exam based on the core courses.

Students are also responsible for checking course prerequisites to be certain they are prepared for the courses they select.

Proposed Graduate Program

	Course Number	Course Title	Credits	Semester/Year

[Type here]

1	EEE 554	Random Signal Theory	3	Fall/1
2	EEE 425/591	Digital Systems and Circuits	4	Fall/1
3	EEE 433/591	Analog Integrated Circuits	4	Fall/1
4	CSE 551	Foundations of Algorithms	3	Spring/1
5	EEE 525	VLSI	4	Spring/1
6	CSE 520	Computer Architecture 2	3	Spring/1
7	EEE 511	Artificial Neural Computation	3	Fall/2
8	EEE 523	Advanced Analog Integrated Circuits	4	Fall/2
9	EEE 526	VLSI Architectures	3	Fall/2
10	CSE 575	Statistical Machine Learning	3	Spring/2

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PLAN OF STUDY WORKSHEET

COMPUTER ENGINEERING (ELECTRICAL ENGINEERING)

MS Degree (thesis)

This is a sample plan of study, which meets the degree requirements for the Computer Engineering (Electrical Engineering) MS program. Course selection is up to the individual and should be made based on academic and career goals. Students are required to complete the following:

- Core courses: EEE 554 and CSE 551. EEE 554 must be completed in the first semester of study and CSE 551 must be completed in the first year of study.
- Area courses: Complete list of area courses can be found here. Students must select three EEE/CEN area courses and one CSE/CEN area course. Of the four area courses, students need to cover at least two different areas (EX: three courses in the VAES area and one course in the ASR area is acceptable. Not all courses can be from one area).
- Elective courses: Two elective courses, depending on the credits needed to graduate and the student's area of interest. Please note that only some 400 level or 591 courses are approved as electives. That list of courses can be found at the bottom of the approved area course list (linked above).
- Thesis credits: 6 credits CEN 599

Students are also responsible for checking course prerequisites to be certain they are prepared for the courses they select.

Proposed Graduate Program

	Course Number	Course Title	Credits	Semester/Year
1	EEE 554	Random Signal Theory	3	Fall/1
2	EEE 425/591	Digital Systems and Circuits	4	Fall/1
3	EEE 433/591	Analog Integrated Circuits	4	Fall/1
4	CSE 551	Foundations of Algorithms	3	Spring/1
5	EEE 525	VLSI	4	Spring/1
6	CSE 520	Computer Architecture 2	3	Spring/1
7	EEE 511	Artificial Neural Computation	3	Fall/2
8	EEE 523	Advanced Analog Integrated Circuits	4	Fall/2
9	EEE 599	Thesis	3	Fall/2
10	EEE 599	Thesis	3	Spring/2

[Type here]

PLAN OF STUDY WORKSHEET

COMPUTER ENGINEERING (ELECTRICAL ENGINEERING)

PhD Degree

This is a sample plan of study, which meets the degree requirements for the Computer Engineering (Electrical Engineering) PhD program. Course selection is up to the individual and should be made based on academic and career goals. Students are required to complete the following:

- Core courses: EEE 554 and CSE 551. EEE 554 must be completed in the first semester of study and CSE 551 must be completed in the first year of study.
- Area courses: Complete list of area courses can be found here. Students must select three EEE/CEN area courses and one CSE/CEN area course. Of the four area courses, students need to cover at least two different areas (EX: three courses in the VAES area and one course in the ASR area is acceptable. Not all courses can be from one area).
- Elective courses: 2-4 elective courses as needed to meet degree requirements
- Research credits: 12-18 CEN 792 credits
- Dissertation credits: 12 CEN 799 credits

Degree requirements will vary if students have completed a master's degree prior to joining this program. The requirements on this page are for those with a master's degree.

All students are required to complete the qualifying exam, comprehensive exam, and dissertation defense in a timely manner as described in the handbook.

Students are also responsible for checking course prerequisites to be certain they are prepared for the courses they select.

Proposed Graduate Program

	Course Number	Course Title	Credits	Semester/Year
1	EEE 554	Random Signal Theory	3	Fall/1
2	CSE 551	Foundations of Algorithms	3	Fall/1
3	CEN 792	Research	3	Fall/1
4	EEE 525	VLSI	4	Spring/1
5	CSE 520	Computer Architecture 2	3	Spring/1
6	CEN 792	Research	3	Spring/1
7	EEE 511	Artificial Neural Computation	3	Fall/2

[Type here]

8	EEE 523	Advanced Analog Integrated Circuits	4	Fall/2
9	CEN 792	Research	3	Fall/2
10	EEE 526	VLSI Architectures	3	Spring/2
11	CSE 575	Statistical Machine Learning	3	Spring/2
12	CEN 792	Research	3	Spring/2
13	CEN 792	Research	6	Fall/3
14	CEN 799	Dissertation	6	Fall/3
15	CEN 799	Dissertation	6	Spring/3

[Type here]

PLAN OF STUDY WORKSHEET

ROBOTICS AND AUTONOMOUS SYSTEMS (ELECTRICAL ENGINEERING)

MS Degree (non-thesis)

This is a sample plan of study, which meets the degree requirements for the Robotics and Autonomous Systems (Electrical Engineering) MS program. Course selection is up to the individual and should be made based on academic and career goals. Students are required to complete the following:

- Core courses: MAE 501 and MAE 547. Students should complete MAE 501 prior to registering for MAE 547.
- Concentration core courses: EEE 582 and EEE 588
- Courses from other concentrations: Students must select two courses from the other RAS concentrations. The full list of concentration courses can be found in the handbook and on the website. (EX: Students could select to take CSE 511 and EGR 555 to fulfill this requirement but could not select EEE 508 or EEE 511).
- Elective courses: Three or four elective courses, depending on the credits needed to graduate and the student's area of interest.

Non-thesis students are expected to complete the comprehensive exam based on the concentration core courses.

Students are also responsible for checking course prerequisites to be certain they are prepared for the courses they select.

Proposed Graduate Program

	Course Number	Course Title	Credits	Semester/Year
1	MAE 501	Linear Algebra in Engineering	3	Fall/1
2	EEE 480/591	Feedback Systems	4	Fall/1
3	EEE 481/591	Computer Control Systems	4	Fall/1
4	MAE 547	Modeling and Control of Robots	3	Spring/1
5	EEE 582	Linear System Theory	3	Spring/1
6	CSE 511	Data Processing at Scale	3	Spring/1
7	EEE 588	Design of Multivariable Control Systems	3	Fall/2
8	EGR 555	Mechatronic Systems	3	Fall/2
9	EEE 511	Artificial Neural Computation	3	Fall/2
10	MAE 521	Structural Organization	3	Spring/2

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ROBOTICS AND AUTONOMOUS SYSTEMS (ELECTRICAL ENGINEERING)

MS Degree (thesis)

This is a sample plan of study, which meets the degree requirements for the Robotics and Autonomous Systems (Electrical Engineering) MS program. Course selection is up to the individual and should be made based on academic and career goals. Students are required to complete the following:

- Core courses: MAE 501 and MAE 547. Students should complete MAE 501 prior to registering for MAE 547.
- Concentration core courses: EEE 582 and EEE 586
- Courses from other concentrations: Students must select two courses from the other RAS concentrations. The full list of concentration courses can be found in the handbook and on the website. (EX: Students could select to take CSE 511 and EGR 555 to fulfill this requirement but could not select EEE 508 or EEE 511).
- Elective courses: Two elective courses, depending on the credits needed to graduate and the student's area of interest.
- Thesis credits: 6 EEE 599 credits

Students are also responsible for checking course prerequisites to be certain they are prepared for the courses they select.

Proposed Graduate Program

	Course Number	Course Title	Credits	Semester/Year
1	MAE 501	Linear Algebra in Engineering	3	Fall/1
2	EEE 480/591	Feedback Systems	4	Fall/1
3	EEE 481/591	Computer Control Systems	4	Fall/1
4	MAE 547	Modeling and Control of Robots	3	Spring/1
5	EEE 582	Linear System Theory	3	Spring/1
6	CSE 511	Data Processing at Scale	3	Spring/1
7	EEE 588	Design of Multivariable Control Systems	3	Fall/2
8	EGR 555	Mechatronic Systems	3	Fall/2
9	EEE 599	Thesis	3	Fall/2
10	EEE 599	Thesis	3	Spring/2

[Type here]

PLAN OF STUDY WORKSHEET

ARTS, MEDIA, AND ENGINEERING (ELECTRICAL ENGINEERING)

MS Degree

This is a sample plan of study, which meets the degree requirements for the Arts, Media, and Engineering (Electrical Engineering) MS program. Course selection is up to the individual and should be made based on academic and career goals. Students are required to complete the following:

- 2/3rd of the coursework must be EEE prefix (five-six classes)
- 1/3rd of the coursework must be AME prefix (two-three classes)
- Thesis credits: 4 EEE 599 and 2 AME 599 credits

The AME-EE MS is only offered as a thesis program and does not have a non-thesis option.

Students are also responsible for checking course prerequisites to be certain they are prepared for the courses they select.

Proposed Graduate Program

	Course Number	Course Title	Credits	Semester/Year
1	EEE 554	Random Signal Theory	3	Fall/1
2	EEE 407/501	Digital Signal Processing	4	Fall/1
3	EEE 459/591	Communication Networks	3	Fall/1
4	EEE 515	Machine Vision and Pattern Recognition	3	Spring/1
5	EEE 508	Digital Image and Video Processing and Computation	3	Spring/1
6	EEE 510	Multimedia Signal Processing	3	Spring/1
7	AME 598	Designing for Dreamscape	3	Fall/2
8	AME 532	Media Synthesis	3	Fall/2
9	EEE 599	Thesis	4	Fall/2
10	AME 599	Thesis	2	Spring/2

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PLAN OF STUDY WORKSHEET

ARTS, MEDIA, AND ENGINEERING (ELECTRICAL ENGINEERING)

PhD Degree

This is a sample plan of study, which meets the degree requirements for the Arts, Media, and Engineering (Electrical Engineering) PhD program. Course selection is up to the individual and should be made based on academic and career goals. Students are required to complete the following:

- 2/3rd of the coursework must be EEE prefix (four classes)
- 1/3rd of the coursework must be AME prefix (two classes)
- Research or coursework: 12 credits of EEE 792, EEE courses, or AME courses
- Research credits: 8 EEE 792 credits and 4 AME 792 credits
- Dissertation credits: 8 EEE 792 credits and 4 AME 792 credits

Degree requirements will vary if students have completed a master's degree prior to joining this program. The requirements on this page are for those with a master's degree.

All students are required to complete the qualifying exam, comprehensive exam, and dissertation defense in a timely manner as described in the handbook.

Students are also responsible for checking course prerequisites to be certain they are prepared for the courses they select.

Proposed Graduate Program

	Course Number	Course Title	Credits	Semester/Year
1	EEE 554	Random Signal Theory	3	Fall/1
2	AME 598	Expressive Robotics	3	Fall/1
3	EEE 792	Research	3	Fall/1
4	AME 598	Minds and Machines	3	Spring/1
5	EEE 515	Machine Vision and Pattern Recognition	3	Spring/1
6	EEE 792	Research	3	Spring/1
7	EEE 510	Multimedia Signal Processing	3	Fall/2
8	EEE 551	Information Theory	3	Fall/2
9	EEE 792	Research	3	Fall/2

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10	AME 792	Research	4	Spring/2
11	EEE 792	Research	12	Fall/3
11	EEE 799	Dissertation	8	Spring/3
12	AME 799	Dissertation	4	Spring/3

Appendix B – Faculty CVs

NAME: ABERLE, JAMES

ORCID: 0000-0002-0623-0697

POSITION TITLE & INSTITUTION: Associate Professor, Arizona State University

EDUCATION

INSTITUTION	LOCATION	MAJOR / AREA OF STUDY	DEGREE (if applicable)	YEAR YYYY
Polytechnic Institute of New York	Brooklyn, NY	Electrical Engineering	BS	1982
Polytechnic Institute of New York	Brooklyn, NY	Electrical Engineering	MS	1985
University of Massachusetts	Amherst, MA	ELECTRICAL ENGINEERING	PHD	1989

ACADEMIC EXPERIENCE

1995 - present   Associate Professor, Arizona State University, Tempe, AZ

1989 - 1995   Assistant Professor, Arizona State University, Tempe, AZ

NON-ACADEMIC EXPERIENCE

2002 – present Antennovation LLC, sole proprietor

2020 – present RS International LLC, limited partner

CERTIFICATIONS AND PROFESSIONAL REGISTRATIONS

Fundamentals of Engineering exam passed 1992

CURRENT MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS

IEEE, Senior Member

SERVICE ACTIVITIES

School of ECEE Committee memberships: personnel committee, undergraduate curriculum committee

Professional service: reviewer for technical journals

SIGNIFICANT PUBLICATIONS

[Type here]

1.   Geyik C, Hill M, Zhang Z, Aygun K, Aberle J. Measurement Uncertainty Propagation in the Validation of High-Speed Interconnects. 2020 IEEE 29th Conference on Electrical Performance of Electronic Packaging and Systems (EPEPS). 2020 IEEE 29th Conference on Electrical Performance of Electronic Packaging and Systems (EPEPS); ; San Jose, CA, USA. IEEE; c2020. Available from: https://ieeexplore.ieee.org/document/9231369/ DOI: 10.1109/EPEPS48591.2020.9231369

2.   Geyik C, Zhang Z, Aygun K, Aberle J. Machine Learning for Evaluating the Impact of Manufacturing Process Variations in High-Speed Interconnects. 2021 22nd International Symposium on Quality Electronic Design (ISQED). 2021 22nd International Symposium on Quality Electronic Design (ISQED); ; Santa Clara, CA, USA. IEEE; c2021. Available from: https://ieeexplore.ieee.org/document/9424359/ DOI: 10.1109/ISQED51717.2021.9424359

3.   Bryan S, Clarke A, Vanderkluysen L, Groppi C, Paine S, Bliss D, Aberle J, Mauskopf P. Measuring Water Vapor and Ash in Volcanic Eruptions With a Millimeter-Wave Radar/Imager. IEEE Transactions on Geoscience and Remote Sensing. 2017; 55(6):3177-3185. Available from: http://ieeexplore.ieee.org/document/7862840/ DOI: 10.1109/TGRS.2017.2663381

4.   Colon-Diaz N., Janning D., Corigliano T., Wang L., Aberle J.. Measurement of Active Reflection Coefficient for Co-Located MIMO Radar Using Dual Directional Couplers. 2018 AMTA Proceedings; 2018; c2018.

5.   Bensalem B, Aberle J. Effects of Manufacturing Variations on Ultra-High-Speed Integrated Waveguide Memory Interconnects. 2018 IEEE 27th Conference on Electrical Performance of Electronic Packaging and Systems (EPEPS). 2018 IEEE 27th Conference on Electrical Performance of Electronic Packaging and Systems (EPEPS); ; San Jose, CA. IEEE; c2018. Available from: https://ieeexplore.ieee.org/document/8534271/ DOI: 10.1109/EPEPS.2018.8534271

PROFESSIONAL DEVELOPMENT ACTIVITIES

Regular webinar attendance

[Type here]

AHMED ALKHATEEB

Education

Ph.D., ECEE, The University of Texas at Austin, 2016.

Academic experience

Arizona State University, Assistant Professor, 2018-present.

Non-academic experience

Facebook, Inc., Wireless Communications Researcher, 2016-2018

Current membership in professional organizations

IEEE

Honors and awards

- 2012 MCD Fellowship from The University of Texas at Austin

- The 2016 IEEE Signal Processing Society Young Author Best Paper Award

- The NSF CAREER Award 2021

Service activities (within and outside of the institution)

- Editor, IEEE Transactions on Communications

- Editor, IEEE Wireless Communication Letters

- Co-Chair, IEEE Globecom Workshop on Machine Learning for Communications, 2020

- Member, Search Committee on Quantum Information Processing, 2021

Most important publications and presentations from the past five years

- A. Alkhateeb, S. Alex, P. Varkey, Y. Li, Q. Qu and D. Tujkovic, "Deep Learning Coordinated Beamforming for Highly-Mobile Millimeter Wave Systems," in IEEE Access, vol. 6, pp. 37328-37348, 2018, doi: 10.1109/ACCESS.2018.2850226.
- M. Alrabeiah and A. Alkhateeb, "Deep Learning for mmWave Beam and Blockage Prediction Using Sub-6 GHz Channels," in IEEE Transactions on Communications, vol. 68, no. 9, pp. 5504-5518, Sept. 2020, doi: 10.1109/TCOMM.2020.3003670.
- Taha, M. Alrabeiah and A. Alkhateeb, "Enabling Large Intelligent Surfaces With Compressive Sensing and Deep Learning," in IEEE Access, vol. 9, pp. 44304-44321, 2021, doi: 10.1109/ACCESS.2021.3064073.
- T. S. Rappapor,t, Y. Xing, O. Kanhere, S. Ju, A. Madanayake, S. Mandal, A. Alkhateeb, G. Trichopoulos, "Wireless Communications and Applications Above 100 GHz: Opportunities and Challenges for 6G and Beyond," in IEEE Access, vol. 7, pp. 78729-78757, 2019, doi: 10.1109/ACCESS.2019.2921522.

[Type here]

- Alkhateeb and R. W. Heath, "Frequency Selective Hybrid Precoding for Limited Feedback Millimeter Wave Systems," in IEEE Transactions on Communications, vol. 64, no. 5, pp. 1801-1818, May 2016, doi: 10.1109/TCOMM.2016.2549517.

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DAVID R. ALLEE

EDUCATION

Post-Doc	Electrical Engineering	Cambridge University	1991
Ph.D.	Electrical Engineering	Stanford University	1990
M.S.	Electrical Engineering	Stanford University	1986
B.S.	Electrical Engineering	University of Cincinnati	1984

ACADEMIC EXPERIENCE

Arizona State University ECEE	Associate Director	2017-present
Arizona State University ECEE	Full Professor	2009-present
Arizona State University ECEE	Associate Professor	1997-2009
Arizona State University ECEE	Assistant Professor	1991-1997

NON-ACADEMIC EXPERIENCE

ASU Flexible Display Center	Director R&D	2004 to 2016
KnowledgeBridge Intl.	Consultant	2011 to present
Universal Display Corporation	Consultant	2014
Army Research Lab	Sabbatical	2013
Intellectual Ventures	Consultant	2009-2011
Motorola	Consultant	2003
Philips Semiconductors	Consultant	2001-2002
Intel	Sabbatical	2000
Scientific Monitoring	Consultant	1999
Intel	Consultant	1996-1997

CURRENT MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

IEEE

American Astronomical Society

HONORS AND AWARDS

National Academy of Inventors

Consistently Top 5% of Teachers Award

Best Teacher Award, College of Engineering, 2008

Young Faculty Teaching Excellence Award, College of Engineering, 1994/1995

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Chair of Flexible Electronics Conference at SPIE Defense, Security and Sensing 2013

Guest Editor for special issues of Journal of Display Technology and Sensors (online)

Military Sensing Symposium, Battlespace Acoustic, Seismic, Magnetic, and Electric-Field Sensing and Signatures, Program Committee, 2014-2019

Custom Integrated Circuits Conference, Technical Program Committee, 2001-2005, Educational Session Chair 2005 and Analog Sub-committee Chair 2005

Developed Several Online Undergraduate Circuits Courses

PUBLICATIONS IN LAST 5 YEARS

1. Z. D. Drummond, K. E. Claytor, D. R. Allee and D. M. Hull, "An Optimized Subspace-Based Approach to Synchrophasor Estimation," in IEEE Transactions on Instrumentation and Measurement, vol. 70, pp. 1-13, 2021, Art no. 1001213, doi: 10.1109/TIM.2020.3017059.
2. Hugh E. Chung, Hugh E. Chung, Michael McMaster, Angelo Delluomo, Oscar Vazquez, Alvin Su, Anthony M. Wilson, and David R. Allee, "Active Two-Dimensional Electric Field Imaging at Very Low Frequencies," IEEE Sensors, vol.17 , issue: 21, pp. 7123-7130, Nov. 2017, 10 pages
3. L. Smith, J.W.Murphy, J.Kim, S.Rozhdestvenskyy, I.Mejia, H.Park, D.R.Allee, M. Quevedo-Lopez, B.Gnade, "Thin film CdTe based neutron detectors with high thermal neutron efficiency and gamma rejection for security applications," *Nuclear Instruments and Methods in Physics Research A*, vol. 838, pp. 117-123, 2016
4. H. Chung, W. Ye, S. Vora, S. Rednour, D. Allee, "A passive very low frequency electric field imager," *IEEE Sensors*, vol.16 , issue: 9, pp. 3181 – 3187, May 2016
5. US patent 10589124, awarded 2020, Integrated high-resolution untethered flexible neural implant, Joseph Smith, Barry O'Brien, Yong-kyun Lee, Edward Bawolek, Jennifer Blain Christen, Michael Goryll, Jitendran Muthuswamy, George R. Kunnen, David Allee
6. *US patent* 10,416,244, awarded 2019, Three-dimensional imaging utilizing low frequency magnetic fields, David R. Allee, Gregory P. Spell, Brett Larsen, Anthony M. Wilson, Owen C. Ma
7. *US patent* 10,180,504, awarded 2019, Adaptive Detection Sensor Array and Method of Providing and Using the Same, Joseph Smith, E. Forsythe, David Allee
8. *US patent* 10,147,360, awarded 2018, Rugged Display Device Architecture, Michael Hack, David Allee
9. *US patent* 9,910,171, awarded 2018, Thin Film Transistor Detection Systems and Related Methods, George Kunnen, David Allee
10. *US patent 9,903,959*, awarded 2018, Adaptive detection sensor array and method of providing and using the same, Joseph Smith, Eric Forsythe, and David Allee
11. M. Goryll, T.J. Thornton, C. Wang, S.M. Phillips, D. Allee, "Online undergraduate laboratories in electrical engineering", IEEE Frontiers in Education, 16-19 October 2019, Cincinnati, Ohio 4 pages
12. Z. Drummond, I. Lontsi, K. Claytor, B. Parks, D. Hull, D. Allee, "Real time accurate measurements of power systems," Military Sensing Symposium, Battlespace, Acoustic, Seismic, Magnetic and Electric-field Sensing and Signatures, 22-25 October 2018, Gaithersburg, Maryland, 16 pages
13. J.T. Smith, E. Bawolek, J. Trujillo, G. Raupp, D.R. Allee, J.B. Christen, "Adapting large area flexible hybrid TFT/CMOS electronics and display technology to create an optical sensor array architecture," International Symposium on Circuits and Systems (ISCAS), 2017 IEEE, 28-31 May 2017, Baltimore, Maryland, 4 pages
14. D. Allee, D. Hull, and E. Forsythe, "Very low frequency electric field imaging of concealed structures," Military Sensing Symposium, Battlespace, Acoustic, Seismic, Magnetic and Electric-field Sensing and Signatures, 20-23 June 2016, Gaithersburg, Maryland, 9 pages

RAJA AYYANAR

Professor

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EDUCATION:

Ph.D., Electrical Engineering, University of Minnesota, Minneapolis, 2000

M.S., Electrical Engineering, Indian Institute of Science, Bangalore, India, 1995

B.E., Electrical and Electronics Engineering, PSG College of Technology, India 1989

ACADEMIC EXPERIENCE:

Arizona State University, Tempe, Arizona

Professor, Electrical Computer and Energy Engineering, 2017 – present, full time

Associate Professor, Electrical Computer and Energy Engineering, 2006 –2017, full time

Assistant Professor, Electrical Engineering, 2000 – 2006, full time

NON-ACADEMIC EXPERIENCE:

Senior design engineer, Premier Instruments and Control Limited, Coimbatore, India, 1989-1992

PROFESSIONAL MEMBERSHIPS

IEEE Senior member

HONORS AND AWARDS

Fulton Faculty Exemplar Award, 2017-2018 (Fulton Schools of Engineering, ASU)

Outstanding Engineer of the Year, IEEE PES Phoenix Chapter, 2011

ONR Young Investigator Award, 2005

SERVICE ACTIVITIES

Associate Editor of IEEE Transactions on Power Electronics, 2008 – March 2021

Publicity Chair for IEEE Energy Conversion Congress and Expo (ECCE) 2011

Several proposal review panels for NSF and DOE

SELECTED PUBLICATIONS AND PRESENTATIONS IN THE LAST FIVE YEARS:

1. Y. Si, N. Korada, R. Ayyanar and Q. Lei, "A High Performance Communication Architecture for a Smart Micro-Grid Testbed Using Customized Edge Intelligent Devices (EIDs) with SPI and Modbus TCP/IP Communication Protocols," in *IEEE Open Journal of Power Electronics*, doi: 10.1109/OJPEL.2021.3051327, 2021 (available in IEEE Early Access)

2. Y. Xia, J. Roy and R. Ayyanar, "Optimal Variable Switching Frequency Scheme to Reduce Loss of Single-Phase Grid-Connected Inverter With Unipolar and Bipolar PWM," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 9, no. 1, pp. 1013-1026, Feb. 2021, doi: 10.1109/JESTPE.2019.2956034.

3. D. Wu, H. Qamar, H. Qamar and R. Ayyanar, "Comprehensive Analysis and Experimental Validation of 240^0-Clamped Space Vector PWM Technique Eliminating Zero States for EV Traction Inverters With Dynamic DC Link," in *IEEE Transactions on Power Electronics*, vol. 35, pp. 13295-13307, Dec. 2020, doi: 10.1109/TPEL.2020.2994599.

4. Y. Xia, J. Roy and R. Ayyanar, "A Single Stage Common Ground Three-Level PV Inverter With Integrated Power Decoupling," in *IEEE Open Journal of Power Electronics*, vol. 1, pp. 227-237, 2020, doi: 10.1109/OJPEL.2020.3010227.

5. D. Wu, R. Ayyanar, M. Sondharangalla and T. Meyers, "High-Performance Active-Clamped Isolated SEPIC PFC Converter With SiC Devices and Lossless Diode Clamp," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, vol. 8, no. 1, pp. 567-577, March 2020, doi: 10.1109/JESTPE.2019.2944593.

6. R.S. Mongrain, R. Ayyanar, "Multi-platform real-time microgrid simulation testbed with hierarchical control of distributed energy resources featuring energy storage balancing," in *IET Renewable Power Generation*, vol. 14, pp. 834-844, April 2020. DOI: 10.1049/iet-rpg.2019.0525

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7. R.S. Mongrain, R. Ayyanar, "Control of nonideal grid-forming inverter in islanded microgrid with hierarchical control structure under unbalanced conditions," in *International Journal of Electrical Power and Energy Systems*, vol. 119, July 2020. DOI: 10.1016/j.ijepes.2020.105890
8. Y. Xia, J. Roy and R. Ayyanar, "GaN-based split phase transformer-less PV inverter with auxiliary ZVT circuit," in *IET Power Electronics*, vol. 13, pp. 525-534, February 2020. DOI: 10.1049/iet-pel.2019.0498
9. L. Ibarra, P. Ponce, R. Ayyanar, A.A. Molina, "A Non-Adaptive Single-Phase PLL Based on Discrete Half-Band Filtering to Suppress Severe Frequency Disturbances," *Energies* , no. 7:1730, 2020.
10. J. Roy, Y. Xia, R. Ayyanar, "Half-Bridge Voltage Swing Inverter With Active Power Decoupling for Single-Phase PV Systems Supporting Wide Power Factor Range," *IEEE Transactions on Power Electronics*, August 2019, vol. 34, pp. 7450-7461

RECENT PROFESSIONAL DEVELOPMENT:

ARPA-E Energy Innovation Summit, 2021, Virtual Conference.

NSF-Sponsored ECE Department Heads and Faculty Online Workshop "Dissemination of Electric "Power" Courses/Laboratories Developed through ONR Funding" March 8, 2021

Power America Annual Workshop, Raleigh, NC, February, 2019.

EPRI workshop on OpenDSS and distribution system modeling, SRP, Phoenix, 2014

BERTAN BAKKALOGLU, PROFESSOR

Education

Undergraduate Institution:

Bogazici University Department of Electrical Engineering, Istanbul, Turkey. BSEE, 1990.

Graduate Institution 1:

University of Houston Department of Electrical Engineering, Houston, TX, MSc, 1992.

Graduate Institution 2:

Oregon State University Department of Electrical and Computer Engineering, Corvallis, OR, PhD, 1996.

Academic experience

2008-present   Associate Director, Connection One NSF I/UCRC, Arizona State University

Aug 2012-Present Professor, Department of Electrical Engineering, Arizona State University

Aug 2004-2012 Associate Professor, Department of Electrical Engineering, Arizona State University

Non-academic experience

June 2002-Aug 2004   Design Manager and Senior Member of Technical Staff, Broadband Silicon Technology Center, Texas Instruments Inc. Dallas, TX

June 1998-June 2002   Chip Architect and Senior Member of Technical Staff, Wireless Analog Baseband, RF and Power Management Products, Texas Instruments Inc. Dallas, TX

Jan 1996-June 1998   Analog, Mixed Signal Designer and Member of Technical Staff, Wireless/Wireline Analog Baseband Products, Texas Instruments Inc. Dallas, TX

Current membership in professional organizations

IEEE Microwave Theory and Techniques Society

Honors and awards

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IEEE Fellow, ON Semiconductor Professor, ECEE

8. Service activities (within and outside of the institution)

RFIC, MTT-S FINANCIALLY-OWNED CONFERENCES (EXCL. IMS), MEETINGS AND SYMPOSIA COMMITTEE, STANDING COMMITTEES CHAIR, RFIC EXCOM, MEETINGS AND SYMPOSIA COMMITTEE, STANDING COMMITTEES VICE-CHAIR, MTT-15 RF/MIXED-SIGNAL INTEGRATED CIRCUITS AND SIGNAL PROCESSING, TECHNICAL COMMITTEES

IEEE Transactions on Circuits and Systems, Associate Editor

Most important publications and presentations from the past five years –

K. Joshi, Z. Yang, C. Fu, D. Mandal, G. Waterfall and B. Bakkaloglu, "A Mixed-Signal Adaptive Ripple Canceler for Switching Regulators Providing 18 dB-24 dB of Ripple Rejection up to 1 MHz," in IEEE Transactions on Power Electronics, vol. 35, no. 10, pp. 10249-10259, Oct. 2020.

C. Liu et al., "A 50-V Isolation, 100-MHz, 50-mW Single-Chip Junction Isolated DC-DC Converter With Self-Tuned Maximum Power Transfer Frequency," in IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 66, no. 6, pp. 1003-1007, June 2019.

P. C. Adell, M. Sun, K. Joshi, G. Allen, Z. Yang and B. Bakkaloglu, "Radiation-Tolerant Digital Multiphase Current-Mode Hysteretic Point-of-Load Regulator," in IEEE Transactions on Nuclear Science, vol. 65, no. 3, pp. 896-902, March 2018.

Y. Jing and B. Bakkaloglu, "A High Slew-Rate Adaptive Biasing Hybrid Envelope Tracking Supply Modulator for LTE Applications," in IEEE Transactions on Microwave Theory and Techniques, vol. 65, no. 9, pp. 3245-3256, Sept. 2017.

S. A. Ayati, D. Mandal, B. Bakkaloglu and S. Kiaei, "Integrated Quasi-Circulator With RF Leakage Cancellation for Full-Duplex Wireless Transceivers," in IEEE Transactions on Microwave Theory and Techniques, vol. 66, no. 3, pp. 1421-1430, March 2018.

K. Joshi, S. Manandhar and B. Bakkaloglu, "A 5.6 μ A Wide Bandwidth, High Power Supply Rejection Linear Low-Dropout Regulator With 68 dB of PSR Up To 2 MHz," in IEEE Journal of Solid-State Circuits, vol. 55, no. 8, pp. 2151-2160, Aug. 2020.

C. Desai, D. Mandal, B. Bakkaloglu and S. Kiaei, "A 1.66 mV FOM Output Cap-Less LDO With Current-Reused Dynamic Biasing and 20 ns Settling Time," in IEEE Solid-State Circuits Letters, vol. 1, no. 2, pp. 50-53, Feb. 2018.

P. Mahmoudidaryan, D. Mandal, B. Bakkaloglu and S. Kiaei, "Wideband Hybrid Envelope Tracking Modulator With Hysteretic-Controlled Three-Level Switching Converter and Slew-Rate Enhanced Linear Amplifier," in IEEE Journal of Solid-State Circuits, vol. 54, no. 12, pp. 3336-3347, Dec. 2019.

R. Magod, N. Suda, V. Ivanov, R. Balasingam and B. Bakkaloglu, "A Low-Noise Output Capacitorless Low-Dropout Regulator With a Switched-RC Bandgap Reference," in IEEE Transactions on Power Electronics, vol. 32, no. 4, pp. 2856-2864, April 2017.

M. Cheah, D. Mandal, B. Bakkaloglu and S. Kiaei, "A 100-mA, 99.11% Current Efficiency, 2-mVpp Ripple Digitally Controlled LDO With Active Ripple Suppression," in IEEE Transactions on Very Large Scale Integration (VLSI) Systems, vol. 25, no. 2, pp. 696-704, Feb. 2017.

HUGH J. BARNABY

Education

- Ph.D., Electrical Engineering, Vanderbilt University, 2002
- MSEE, Electrical Engineering, Vanderbilt University, 1999
- B.A., Mathematics and Philosophy, University of California, Berkeley, 1992

Academic Experience (All full time)

- Arizona State University, Professor (IceMOS Chair), March 2019 – present
- Arizona State University, Professor, August 2017 – March 2019 –
- Arizona State University, Associate Professor, August 2009 – August 2017
- Arizona State University, Assistant Professor, August 2004 – August 2009
- University of Arizona, Assistant Professor, January 2002 – August 2004

Non-academic Experience

Consultant, 2003-present

- Jet Propulsion Laboratory, Pasedena, CA
- NuFlare Technologies, Sunnyvale, CA,
- Air Force Research Laboratory – RVSE, Albuquerque, NM
- Maxim Integrated, Dallas, TX
- Medtronic Inc., Tempe, AZ
- Landauer Inc., Glenwood IL
- Ridgetop Group, Tucson, AZ
- National Semiconductor Corporation, Tucson, AZ
- Staff Scientist in Microelectronics, June 1993 - August 1996
- Mission Research Corporation, Albuquerque, NM

Current membership in professional organizations

- Institute of Electrical and Electronics Engineers, Fall 1996   Ongoing
- Solid State Circuit Society IEEE society, Fall 1996 Ongoing
- Nuclear and Plasma Physics Society IEEE society, Fall 1996   Ongoing
- Electron Device Society IEEE society, Fall 1996   Ongoing

Honors and awards

- Fellow IEEE, 2017-01-02 Spring 2017   Ongoin

Service

- University Senate - Committee on Research and Creative Activities, Spring 2019-Ongoing
- Personnel Committee, Fall 2018-Ongoing
- ECEE Faculty Search Committee, Fall 2018 - Spring 2020
- Senate Online Task Force, Spring 2018-Fall 2019
- University Senate - Personnel Committee, Spring 2015-Fall 2019
- Personnel Committee Bylaws subtask, Spring 2015   Fall 2016
- ECEE Area Chairs Committee, Spring 2014   Fall 2019
- Faculty Senate, Spring 2014-Ongoing
- IEEE   NSREC, Technical Program Committee 2014 - 2015
- IEEE   NSREC, Technical Program Chairperson 2017-2018
- RADECS, Technical Program Committee 2012, 2013, 2018
- IEEE, NSREC, General Program Chairperson, 2017-2021
- IOP Semiconductor Science and Technology   , Guest Editor

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Publications:

- Z. Ye, R. Liu, H. J. Barnaby, and S. Yu, "Evaluation of Single Event Effects in SRAM and RRAM Based Neuromorphic Computing System for Inference," *2019 IEEE International Reliability Physics Symposium (IRPS),* pp. 1-4, 2019.
- J. L. Taggart, R. B. Jacobs-Gedrim, M. L. McLain, H. J. Barnaby, E. S. Bielejec, W. Hardy, M. J. Marinella, M. N. Kozicki, and K. Holbert, "Failure Thresholds in CBRAM Due to Total Ionizing Dose and Displacement Damage Effects," *IEEE Transactions on Nuclear Science,* vol. 66, no. 1, pp. 69-76, Jan 2019.
- P. Livingston, I. S. Esqueda, and H. J. Barnaby, "Explicit approximation of the surface potential equation of a dynamically depleted silicon-on-insulator MOSFET for performance and reliability simulations," *Solid-State Electronics,* vol. 160, p. 107609, 2019.
- Privat, H. J. Barnaby, P. C. Adell, B. Tolleson, Y. Wang, X. Han, P. Davis, B. Rax, and T. E. Buchheit, "Multiscale modeling of total ionizing dose effects in commercial-off-the-shelf parts in bipolar technologies," *IEEE Transactions on Nuclear Science,* vol. 66, no. 1, pp. 190-198, Jan 2019.
- J. L. Taggart, W. Chen, Y. Gonzalez-Velo, H. J. Barnaby, K. Holbert, and M. N. Kozicki, "In Situ Synaptic Programming of CBRAM in an Ionizing Radiation Environment," *IEEE Transactions on Nuclear Science*, vol. 65, pp. 192-199, Jan 2018.
- R. Fang, I. Livingston, I. S. Esqueda, M. Kozicki, and H. Barnaby, "Bias temperature instability model using dynamic defect potential for predicting CMOS aging," *Journal of Applied Physics*, vol. 123, no. 22, p. 225701, 2018. 9 pages
- J. Barnaby, R. D. Schrimpf, K. F. Galloway, X. Li, J. Yang, and C. Liu, "Displacement Damage in Bipolar Junction Transistors: Beyond Messenger-Spratt," *IEEE Transactions on Nuclear Science*, vol. 64, pp. 149-155, Jan 2017.
- W. Chen, N. Chamele, Y. Gonzalez-Velo, H. Barnaby, and M. Kozicki, "Low Temperature Characterization of Cu-Cu: silica Based Programmable Metallization Cell," *IEEE Electron Device Letters*, vol. 38, pp. 1244-1247, Sep 2017.
- Y. Gonzalez-Velo, H. J. Barnaby, and M. N. Kozicki, "Review of radiation effects on ReRAM devices and technology," *Semiconductor Science and Technology*, vol. 32, Aug 2017.

Professional Development

Teach 3-4 course per year in Physical Electronics and Circuits (UGRAD and GRAD); Currently advise eight graduate students and fourteen undergraduate students. Manager of ASU SCALE Workforce development program in Radiation Effects.

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MARIANA I. BERTONI

Education

Ph.D. Materials Science and Eng., Northwestern University   , 2007

Diploma (ME) Chemical Eng., ITBA (Buenos Aires Institute of Technology), 2000

B.E. Chemical Eng., ITBA (Buenos Aires Institute of Technology), 1999

Academic Experience

ASU, Associate Professor, Fulton Energy and Materials Professor, 2021-Present, Full time

ASU, Associate Professor, Fulton Entrepreneurial Professor, 2020-Present, Full time

ASU, Associate Professor, 2019-Present, Full time

ASU, Assistant Professor, 2013-2019, Full time

MIT, Visiting Researcher, 2010-2012, Part time, Postdoctoral Fellow, 2008-2010, Full time

Non- Academic Experience

Crystal Sonic Inc., CTO and Founder, 2018-present

Integrated Photovoltaics Inc., Senior Materials Engineer, 2012

1366 Technologies Inc., Senior Photovoltaics Engineer, 2010-2012

Evonik Degussa GmbH, Marie Curie Fellow, impedance evaluation of zeolitic systems, 2007

ExxonMobil Corp, Business and Pricing Analyst, Argentina, 2000 - 2002

TotalFina ELF, Junior Process Engineer, Water purification for combined cycle, 1999 - 2000

Current membership in professional organizations

Institute of Electrical and Electronics Engineers, IEEE

Materials Research Society, MRS

Society of Women Engineers, SWE

Honors and awards

Fulton Energy and Materials Professorship, 2021-2026

IEEE Senior Member, Oct 2020

Top 10% most downloaded articles, J. Synchrotron Radiation 2020

Fulton Entrepreneurial Professor Fellowship, Jan 2020

Finalist American Made Solar Prize -Rd 1, (10/176), Sep. 2019

Distinguished Faculty Scholar, Palais Educational Foundation, 2018-2019

IEEE PVSC Napkin Award, for service to the technical program of WCPEC-7, Jun. 2018

National Academy of Engineering, US Frontiers of Engineering – Sep. 2017

Fulton Outstanding Assistant Professor Award, Arizona State University, 2016

Solar Revolution Project Fellowship, Massachusetts Institute of Technology, 2008

Edward C. Henry Award, The American Ceramic Society – 2007

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Marie Skłodowska-Curie Fellowship, European Commission 2007

Service activities (within and outside of the institution)

Member Editorial Board, Solar Energy Materials and Solar Cells (If 6.019), Dec. 2020-Present

Member Editorial Board, Journal Physics D (If 3.169), Renewable and Sustainable Energy section, Dec. 2018-Dec 2020

Operations Chair, 48th IEEE PV Specialist Conference, Virtual, 2021

Conference Program Chair, 46th IEEE PV Specialist Conference, Chicago IL, 2019

International Committee, IEEE PV Specialist Conference (2013-present)

Organizer and Chair , 9th International Workshop on Science and Technology of Crystalline Si Solar Cells, Tempe AZ, Oct. 2016

Publications

T. Nietzold, N. Valdes, M. Stuckelberger, M. Chiu, T. Walker, A. Jeffries, A. Sinha, L. T. Schelhas, B. Lai, W. Shafarman, M. Bertoni "The Role of Cation Ordering on Device Performance in (Ag,Cu)InSe2 Solar Cells with KF Post-Deposition Treatment" ACS Applied Energy Materials, 4, 1, 233–241, (2021).

S. Husein, J. E. Medvedeva, J. D. Perkins, M. I.Bertoni, "The Role of Cation Coordination in the Electrical and Optical Properties of Amorphous Transparent Conducting Oxides" Chem. Mater., 32, 15, 6444–6455 (2020).

B. West, M. Stuckelberger, B. Lai, J. Maser, and M. I. Bertoni, "Nanoscale Growth Kinetics of Cu(In,Ga)Se2 Absorbers ," J. Phys. Chem. C 122, 40, 22897-22902, 2018

S. Husein, M. Stuckelberger, B. West, L. Ding, F. Dauzou, M. Morales-Masis, M. Duchamp, Z. Holman, and M. I. Bertoni, "Carrier scattering mechanisms limiting mobility in hydrogen doped indium oxide," Journal of Applied Physics 123, 245102, 2018.

T. Naerland, S. Bernardini, and M. I. Bertoni, "On the Recombination Centers of Iron-Gallium pairs in Ga-doped silicon," J. App. Phys., vol. 122, pp. 085703, 2017.

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JOHN S. BRUNHAVER

Assistant Professor

EDUCATION:

Ph.D., Electrical Engineering, Stanford University, 2015

M.S., Electrical Engineering, Stanford University, 2011

B.S., Electrical and Computer Engineering, Northeastern University, 2008

ACADEMIC EXPERIENCE:

Arizona State University, Tempe, Arizona

Assistant Professor, Electrical Computer and Energy Engineering, 2015 – , full time

NON-ACADEMIC EXPERIENCE:

NVIDIA, Santa Clara, California; Architecture Power Modeling Intern, 2012, full time

NVIDIA, Santa Clara, California; Graphics Research Intern, 2011, full time

Intel, Santa Clara, California; Computer Architecture Research Intern, 2010, full time

Intel, Hudson, Massachusetts; Computer Architecture Intern, 2008, full time

Intel, Hudson, Massachusetts; Computer Architecture Intern 2007, full time

Intel, Hudson, Massachusetts; Digital Implementation Intern 2006, full time

Intel, Hudson, Massachusetts; Analog Implementation Intern 2005, full time

PROFESSIONAL MEMBERSHIPS

IEEE

ACM

SELECTED PUBLICATIONS AND PRESENTATIONS IN THE LAST FIVE YEARS:

Libano, F.; Rech, P.; Neuman B.; Leavitt J.; Wirthlin, M.; **Brunhaver, J.**, "How Reduced Data Precision and Degree of Parallelism Impact the Reliability of Convolutional Neural Networks," IEEE Transactions on Nuclear Science, 2021

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Libano, F.; Wilson, B.; Wirthlin, M.; **Brunhaver, J.**, "Understanding the Impact of Quantization, Accuracy, and Radiation on the Reliability of Convolutional Neural Networks on FPGAs," IEEE Transactions on Nuclear Science, 2020

Clark, LT.; Medapuram, SB.; Kadiyala, DK.; **Brunhaver, J.**, "Physically Unclonable Functions using Foundry SRAM Cells", IEEE Transactions on Circuits and Systems I: Regular Papers, 2018

Brunhaver, J.; Uhrie, R.; Clark LT.; "Itemization and Track Limitation of Fan-Out-Free Functions for Static CMOS Functional Cells", IEEE Transactions on Circuits and Systems II: Express Briefs 2018

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CAO, YU

Education

Ph.D., Electrical Engineering, University of California, Berkeley, 2002

M.A., Biophysics, University of California, Berkeley, 1999

B.S., Physics, Peking University, China, 1996

Academic experience

Arizona State University, School of Electrical, Computer and Energy Engineering, Professor, 2015 – present

Kyoto University, Graduate School of Informatics, Visiting Associate Professor, 2013-2014

Arizona State University, School of Electrical, Computer and Energy Engineering, Associate Professor, 2009 – 2015

Arizona State University, Dept of Electrical Engineering, Assistant Professor, 2004 – 2009

Current membership in professional organizations

Fellow, IEEE, Member, ACM

Honors and awards

Intel Outstanding Researcher Award, 2021

IEEE Fellow, "for development of predictive technology models for reliable circuit and system integration," 2017

Top 5% Teaching Award, Ira. A. Fulton Schools of Engineering, ASU, 2010, 2012, 2013, 2015, 2016, 2021

Best Paper Award, IEEE Computer Society Annual Symposium on VLSI, 2012

ACM SIGDA Outstanding New Faculty Award, 2009

Promotion and Tenure Faculty Exemplar, Arizona State University, 2009

Distinguished Lecturer of the IEEE Circuits and Systems Society (CAS), 2009

Best Paper Award, International Symposium on Low Power Electronics and Design, 2007

IBM Faculty Award, 2006, 2007

NSF Faculty Early Career Development (CAREER) Award, 2006

Best Paper Award, International Symposium on Quality Electronic Design, 2004

Beatrice Winner Award, International Solid-State Circuits Conference, 2000

Service activities (within and outside of the institution)

• Associate Editor, Integrated Circuits and VLSI, Frontiers in Electronics, 2021

• Organizing committee, Artificial Intelligence for Robust Engineering & Science (AIRES), 2021

• Co-organizer, Workshop on Accelerating Artificial Intelligence for Embedded Autonomy (AAIEA), 2020

• Associate Editor, Microelectronics Reliability, Elsevier, 2018

• Co-chair of Workshop on Hardware and Algorithms for Learning On-a-chip (HALO), 2017

• Associate Editor, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 2012 – 2018

Important publications and presentations from the past five years

[Type here]

[1] G. Charan, A. Mohanty, X. Du, G. Krishnan, R. V. Joshi, Y. Cao, "Accurate inference with inaccurate RRAM devices: A joint algorithm-design solution," IEEE Journal of Exploratory Solid-State Computational Devices and Circuits, vol. 6, no. 1, pp. 27-35, June 2020.

[2] Y. Ma, Y. Cao, S. Vrudhula, J. Seo, "Performance modeling for CNN inference accelerators on FPGA," IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, vol. 39, no. 4, pp. 843-856, April 2020.

[3] M. Kim, A. Mohanty, D. Kadetotad, L. Wei, X. He, Y. Cao, J. Seo, "A Real-time 17-scale object detection accelerator with adaptive 2000-stage classification in 65nm CMOS," IEEE Transactions on Circuits and Systems I, vol. 66, no. 10, pp. 3843-3853, October 2019.

[4] C. S. Thakur, J. Molin, G. Cauwenberghs, G. Indiveri, K. Kumar, N. Qiao, J. Schemmel, R. Wang, E. Chicca, J. O. Hasler, J. Seo, S. Yu, Y. Cao, A. van Schaik, R. Etienne-Cummings, "Large-scale neuromorphic spiking array processors: A quest to mimic the brain," Frontiers in Neuroscience, vol. 12, pp. 891:1-37, December 2018. https://doi.org/10.3389/fnins.2018.00891, https://arxiv.org/abs/1805.08932

[5] Y. Ma, N. Suda, Y. Cao, S. Vrudhula, J. Seo, "ALAMO: FPGA acceleration of deep learning algorithms with a modularized RTL compiler," Integration, the VLSI Journal, Elsevier Ltd., vol. 62, pp. 14-23, June 2018. [keynote]

[7] Z. Xu, S. Skorheim, M. Tu, V. Berisha, S. Yu, J. Seo, M. Bazhenov, Y. Cao, "Improving efficiency in sparse learning with the feedforward inhibitory motif," Neurocomputing, Elsevier, vol. 267, pp. 141-151, December 2017.

[8] N. Suda, J. Suh, N. Hakim, Y. Cao, B. Bakkaloglu, "A 65nm Programmable ANalog Device Array (PANDA) for analog circuit emulation," IEEE Transactions on Circuits and Systems I, vol. 63, no. 2, pp. 181-190, February 2016.

CHAITALI CHAKRABARTI

Education: PhD: University of Maryland, College Park, December 1990

MS: University of Maryland, College Park, August 1986

BTech: Indian Institute of Technology, Kharagpur, India, May 1984

Academic experience:

August 2003-present: Professor, Electrical Engg, SECEE, ASU

August 1996-August 2003: Associate Professor, Dept of Electrical Engg, ASU

August 1990-August 1996: Assistant Professor, Dept of Electrical Engg, ASU

Membership: IEEE

Awards:

- IEEE Fellow (Class of 2012)
- 2018 Distinguished Alumni Award, Indian Institute of Technology, Kharagpur, India
- 2013 Distinguished Alumni Award, Dept of Electrical and Computer Engg, University of Maryland, College Park
- Fulton Exemplar Faculty Award 2014-2015, 2015-2016.
- Teaching Awards: Best Teacher Award in CEAS 1994; Top 5% Faculty Ira A. Fulton Schools of Engineering 2012, 2014, 2018, 2019, 2020.

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- Best Paper Awards in SiPS 2005, SAMOS 2007, MICRO 2008, SiPS 2010, SiPS 2011, HPCA 2013, SiPS 2016, SiPS 2018, MICRO Top Picks in 2007, 2009 and 2014.

Services

Senior Editorial Board Member of IEEE JETCAS (2013-present); IEEE Fellows Committee (2018-2020), Chair Technical Committee DISPS, IEEE Signal Processing Society, 2006, 2007. General Co-Chair of SiPS 2015, Associate Editor of multiple IEEE journals, Guest Editor of multiple special issues in IEEE Signal Processing magazine and Journal of Signal Processing Systems.

Publications

- J. Li, A. Rakin, Z. He, D. Fan and C. Chakrabarti, "RADAR: Run-time Adversarial Weight Attack Detection and Accuracy Recovery," Proc. of Design and Test in Europe, 2021.

- J. Zhou, S. Mandal, B. West, S. Wei, U. Ogras, O. Kripfgans, J.B. Fowlkes, T.F. Wensich and C. Chakrabarti, "Front-end Architecture Design for Low Complexity 3D Ultrasound Imaging based on Synthetic Aperture Sequential Beamforming," IEEE Trans on VLSI Systems, 29(2), pp. 333-346. 2021.
- S. Pal and others, "Transmuter: Bridging the Efficiency Gap using Memory and Dataflow Reconfiguration," proc. of 29th Int. Conf. on Parallel Architectures and Compilation Techniques (PACT), Oct 2020.
- D. Mandal, G. Krishnan, C. Chakrabarti, S. Seo, Y. Cao and U. Ogras, "A Latency-Optimized Reconfigurable NoC for In-Memory Acceleration of DNNs" IEEE Journal of Selected Areas in Circuits and Systems, 10(3), pp. 362-373, 2020.
- D. Kadetotad, V. Berisha, C. Chakrabarti and J.-S, Seo, ``A 8.93 TOPS/W LSTM Recurrent Neural Network Accelerator Featuring Hierarchical Coarse-Grain Sparsity for On-Device Speech Recognition," IEEE Journal of Solid State Circuits, 55(7), pp. 1877-1887, 2020.
- J. Zhou, A. Papandreou-Suppappola and C. Chakrabarti, "Parallel Gibbs Sampler for Wavelet-Based Compressive Sensing," Journal of Signal Processing Systems, 92(10), pp. 1101-1114, 2020.
- J. Li, A. Rakin, Y. Xiong, L. Chang, Z. He, D. Fan and C. Chakrabarti, "Defending Bit-Flip Attacks through DNN Weight Reconstruction, proc. of Design Automation Conference, 2020.
- M. Shah, M. Tu, V. Berisha, C. Chakrabarti and A. Spanias, ``Articulation Constrained Learning with Application to Speech Emotion Recognition," *EURASIP Journal on Audio, Speech and Music Processing,* 2019:14.
- M. Mao, X. Peng, R. Liu, J. Li, S. Yu and C. Chakrabarti, ``MAX2: An ReRAM-based Neural Accelerator that Maximizes Data Reuse and Area Utilization," Special Issue on Customized Sub-systems and Circuits for Deep Learning, *Journal of Emerging Technologies, Circuits and Systems*, vol. 9(2), pp. 398-410, June 2019.
- H.-M. Chen, S.-Y. Lee, T. N. Mudge, C.-J. Wu and C. Chakrabarti, ``Configurable-ECC: Architecting a Flexible ECC Scheme to Support Different Sized Accesses in High Bandwidth Memory Systems," *IEEE Transactions on Computers*, 68(5), pp. 646-659, May 2019.
- U. Gupta, S. K. Mandal, M. Mao, C. Chakrabarti and U. Y. Ogras, ``A Deep Q-Learning Approach for Dynamic Management of Heterogeneous Processors," *IEEE Computer Architecture Letters*, 18(1), pp. 14-17, 2019.
- Y. Xiong, V. Berisha and C. Chakrabarti, ``Residual + Capsule Networks (ResCap) for Simultaneous Single-Channel Overlapped Keyword Recognition," Proc. of INTERSPEECH, Sep 2019.
- J. Zhou, S. Wei, R. Jintamethasawat, R. Sampson, O. Kripfgans, J. B. Fowlkes, T. F. Wenisch and C. Chakrabarti, ``High Volume Rate 3D Ultrasound Imaging based on Synthetic Aperture Sequential Beamforming with Chirp-coded Excitation," *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control,* 65(8), pp. 1346-1358, August 2018.
- M. Mao, S. Yu and C. Chakrabarti, ``Design and Analysis of Energy-efficient and Reliable 3D ReRAM Cross-point Array System," *IEEE Trans on VLSI Systems*, 26(7), pp. 1290-1300, 2018.

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- S. Wu, C. Chakrabarti and H. Lee, ``Reducing Energy of Baseband Processor for IoT Terminals with Long Range Wireless Communications," Journal of Signal Processing Systems, 90(10), pp.1345-1355, August 2018.
- S. Pal, J. Beaumont, D.-G. Park, A. Amarnath, S. Feng, C. Chakrabarti, H.-S. Kim, D. Blaauw, T. Mudge ad R. Dreslinski, ``OuterSPACE: An Outer Product based Sparse Matrix Multiplication Accelerator," *Proc. of High Performance Computer Architecture*, pp. 724-736, March 2018.

GAUTAM DASARATHY

Education:

   a. Ph.D., Electrical & Computer Engineering, University of Wisconsin – Madison, 2014

   b. M.S., Electrical & Computer Engineering, University of Wisconsin – Madison, 2010

   c. B.Tech., Electronics & Communications Engineering, VIT University, Vellore, India, 2008

Academic experience:

   a. Assistant Professor, School of Electrical, Computer, and Energy Engineering, Arizona State University. 2018 – present

   b. Post-Doctoral Fellow, Electrical and Computer Engineering, Rice University, 2016-2018

   c. Post-Doctoral Fellow, Machine Learning Department, Carnegie Mellon University, 2014-2016

Non-academic experience:

   a. Research Intern, Mitsubishi Electric Research Labs (MERL), Cambridge, MA, USA. 2010

Current membership in professional organizations: Member of IEEE

Honors and awards:

   a. NSF Faculty Early Career Award (CAREER). 2021

   b. *Ira A. Fulton Schools of Engineering Top 5% Teaching Award* for outstanding contribution to the education of students. 2021, 2020

Service activities:

   a. Review Editor, Frontiers in Signal Processing. 2021-
   b. Virtual Conference Chair, International Conference on Artificial Intelligence and Statistics (AISTATS), 2021

   c. Senior Program Committee: International Joint Conference on AI (ICJAI) 2021; AAAI Conference on Artificial Intelligence (AAAI) 2018, 2021

   c. Faculty Hiring Committee, School of Electrical, Computer, and Energy Engineering, Arizona State University. 2021

Most important publications and presentations from the past five years:

   a. Ghoroghchian, N., Dasarathy, G., Draper, S., *Graph Community Detection from Coarse Measurements: Recovery Conditions for the Coarsened Weighted Stochastic Block Model.* International Conference on AI &Statistics (AISTATS), Apr. `21 (oral, top 3% of submissions)

   b. Li, W., Dasarathy, G., Ramamurthy, K. N., Berisha, V., *Finding the Homology of Decision Boundaries with Active Learning*. Advances in Neural Information Processing Systems (NeurIPS), Dec. `20

   c. LeJeune, D., Dasarathy, G., Baraniuk, R., Thresholding Graph Bandits via GrAPL. International Conference on Artificial Intelligence and Statistics (AISTATS), Palermo, Italy, Jun. `20

   d. Li, W., Dasarathy, G., Berisha, V., Regularization via Structural Label Smoothing. International Conference on Artificial Intelligence and Statistics (AISTATS), Palermo, Italy, Jun. `20

   e. Kandaswamy, K., Dasarathy, G., Oliva, J., Schneider, J., Poczos, B., Multi-fidelity Gaussian Process Bandit Optimisation. Journal of Artificial Intelligence Research (JAIR), Vol. 66, Sept. `19

   f. Manickam, I., Lan, A., Dasarathy, G., Baraniuk, R., IdeoTrace: A Framework for Ideology Tracing with a Case Study on the 2016 U.S. Presidential Election. IEEE/ACM International Conference on Social Networks Analysis and Mining (ASONAM), Vancouver, Canada, Aug. `19 (Full Paper, Top 14%)

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i. Kandaswamy, K., Dasarathy, G., Oliva, J., Schneider, J., Poczos, B., Multi-Fidelity Bayesian Optimisation with Continuous Approximations. International Conference on Machine Learning (ICML), Sydney, Australia, Aug. `17 (acceptance rate: 25.5%)

k. Kandaswamy, K., Dasarathy, G., Schneider, J., Poczos, B., The Multi-Fidelity Multi-Armed Bandit. Advances in Neural Information Processing Systems (NIPS), Barcelona, Spain, Dec. `16

l. Kandaswamy, K., Dasarathy, G., Oliva, J., Schneider, J., Poczos, B., Gaussian Process Bandit Optimization with Multi-delity Evaluations. Advances in Neural Information Processing Systems (NIPS), Barcelona, Spain, Dec. `16 (acceptance rate: 22.7%)

m. Dasarathy, G., Singh, A., Balcan, M. F., Park, J. H., Active Learning Algorithms for Graphical Model Selection. International Conference on Artificial Intelligence and Statistics (AISTATS), Cadiz, Spain, May`16 (Full Oral Presentation, Top 6%)

n. Thaker, P., Dasarathy, G., Nedich, A., On the Sample Complexity and Optimization Landscape for Quadratic Feasibility Problems, IEEE International Symposium on Information Theory (ISIT), Jun. `20

o. Sypherd, T., Diaz, M., Sankar, L., Dasarathy, G., On the alpha-loss Landscape in the Logistic Model, IEEE International Symposium on Information Theory (ISIT), Jun. `20

p. Dasarathy, G., GaussianGraphical Model Selection fromSize ConstrainedMeasurements. IEEE International Symposiumon Information Theory (ISIT), Paris, France, Jul. `19

IVAN SANCHEZ ESQUEDA

Education:

University of Arizona	Tucson, AZ	Electrical Engineering	B.Sc., 2004
Arizona State University	Tempe, AZ	Electrical Engineering	M.Sc., 2006
Arizona State University	Tempe, AZ	Electrical Engineering	Ph.D., 2011

Academic Experience:

2019–present	Assistant Professor, Arizona State University, Tempe, AZ
2016–2019	Research Lead, University of Southern California, Los Angeles, CA
2012–2016	Research Scientist, University of Southern California, Los Angeles, CA
2011–2011	Post-Doctoral Researcher, Arizona State University, Tempe, AZ
2008–2011	Graduate Research Assistant, Arizona State University, Tempe, AZ
2004–2006	Graduate Research Assistant, Arizona State University, Tempe, AZ
2003–2004	Undergraduate Research Assistant, University of Arizona, Tucson, AZ

Non-academic experience:

2006–2008	Test Applications Engineer, Texas Instruments, Inc., Tucson, AZ

Membership in professional organizations:

2005–2021	IEEE Member

Honors and awards:

- 2018   Keston Research Award, University of Southern California Information Sciences Institute
- 2010   Graduate College Fellowship, Arizona State University
- 2009   Best Paper Award. Radiation Effects on Components and Systems (RADECS)
- 2004   Academic distinction award, University of Arizona

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- 2003   Academic distinction award, University of Arizona
- 2002   Academic distinction award, University of Arizona

Service activities:

Associate Editor:

IEEE Transactions on Nuclear Science: 2015-2020.

Journal Article Reviewer:

Transactions on Nuclear Science (IEEE):   Since 2011.

Transactions on Computer-Aided Design of Circuits and Systems (IEEE):   Since 2013.

Transactions on Electron Devices (IEEE):   Since 2016.

Electron Device Letters (IEEE):   Since 2016.

Journal of Solid State Electronics (Elsevier):   Since 2016.

Journal of Microelectronics Reliability (Elsevier):   Since 2016.

Journal of Material Science in Semiconductor Processing (Elsevier):   Since 2016.

Conference committee member:

IEEE Nuclear and Space Radiation Effects Conference (NSREC): Technical chair for session on radiation effects in devices and integrated circuits, 2015.

Conference Abstract Reviewer:

- *Radiation Effects on Components and Systems (RADECS) Conference*:   2011 – 2017.
- *IEEE Nuclear and Space Radiation Effects Conference (NSREC)*:   2013 – 2017.
- *IEEE International Reliability Physics Symposium (IRPS)*:   2014 – 2016.
- *IEEE International Integrated Reliability Workshop (IIRW)*:   2014 – 2016.

Publications:

Summary: >45 refereed articles, h-index = 19, total citations = 1074, selected publications:

- X. Yan, H. Wang, I. S. Esqueda, "Temperature-Dependent Transport in Ultrathin Black Phosphorus Field-Effect Transistors," Nano Letters, vol. 19, no. 1, pp. 482-487, 2018.
- X. Yan, I. S. Esqueda, J. Ma, J. Tice, and H. Wang, "High breakdown electric field in β-Ga2O3/graphene vertical barristor heterostructure," Appl. Phys. Lett., vol. 13, no. 3, pp. 032101, 2018.
- S. Esqueda, H. Tian, X. Yan, H. Wang, "Transport properties and device prospects of ultra-thin black phosphorus on hexagonal boron nitride," IEEE Trans. Elec. Dev., vol. 64, no. 12, pp. 5163-5171, 2017.
- S. Esqueda and C. D. Cress, "Modeling Radiation-Induced Scattering in Graphene," IEEE Trans. Nucl. Sci., vol. 62, no. 6, pp. 2906-9113, 2015.
- D. Cress, J. G. Champlain, I. S. Esqueda, J. T. Robinson, A. L. Friedman and J. J. McMorrow, "Total ionizing dose induced charge carrier scattering in graphene devices," IEEE Trans. Nucl. Sci., vol. 59, no. 6, pp. 3045-3053, 2012.
- S. Esqueda, H. Zhao, H. Wang, "Efficient Learning and Crossbar Operations with Atomically-Thin 2-D Material Compound Synapses, Journal of Applied Physics, vol. 124, no. 15, pp. 152133, 2018.
- S. Esqueda, X. Yan, P. Marsh, K. Galatsis, H. Wang, C. Zhou, "Aligned Carbon Nanotube Synaptic Transistors for Large-Scale Neuromorphic Computing," ACS Nano, vol. 12, no. 7, pp. 7352-7361, 2018.
- S. Esqueda, C. D. Cress, Y. Cao, Y. Che and C. Zhou, "The impact of defect scattering on the quasi-Ballistic transport of nanoscale conductors," Journal of Applied Physics, 117, 084319, 2015.

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- S. Esqueda, C. D. Cress, Y. Che, Y. Cao and C. Zhou, "Charge trapping in aligned single-walled carbon nanotube arrays induced by ionizing radiation exposure," Journal of Applied Physics, 115, 054506, 2014.
- M. Musisi-Nkambwe, S. Afshari, H. Barnaby, M. N. Kozicki, I. S. Esqueda, "The Viability of Analog-based Accelerators for Neuromorphic Computing: A Survey," Neuromorphic Computing and Engineering, *in press*, 2021.
- B. Trivedi *et al.*, "Room-Temperature Synthesis of 2D Janus Crystals and their Heterostructures," Advanced Materials, vol. 32, no. 50, pp. 2006320, 2020.

DELIANG FAN

Education – degree, discipline, institution, year

- Ph.D. in Electrical and Computer Engineering
  Purdue University, West Lafayette, IN, USA , Aug. 2015

- Master of Science in Electrical and Computer Engineering
  Purdue University, West Lafayette, IN, USA, Dec. 2012

- Bachelor of Electronic Information Engineering
  Zhejiang University, Hangzhou, China, Jun. 2010

Academic experience

- Tenure-Track Assistant Professor at School of Electrical, Computer and Energy Engineering
  Arizona State University (ASU), Tempe, AZ, USA   Aug. 2019 - present

- Courtesy Professor at Department of Electrical and Computer Engineering
  University of Central Florida (UCF), Orlando, FL, USA   Aug. 2019- 2021

- Tenure-Track Assistant Professor at Department of Electrical and Computer Engineering
  University of Central Florida (UCF), Orlando, FL, USA   Aug. 2015-Aug. 2019

- Research Assistant at Nanoelectronics Research Lab
  Purdue University, West Lafayette, IN, USA   Mar.2012-Aug. 2015

Current membership in professional organizations

- Member of *Institute of Electrical and Electronics Engineers* (*IEEE*)
- Member of *Association for Computing Machinery* (*ACM*)
- Member of *ACM Special Interest Group in Design Automation (SIGDA)*
- Member of *IEEE Council on Electronic Design Automation (CEDA)*

Honors and awards

- Best Paper Award in ACM Great Lakes Symposium on VLSI (*GLSVLSI*), Washington, D.C., USA, 2019
- Best Paper Award in IEEE Computer Society Annual Symposium on VLSI *(ISVLSI),* Hong Kong, China, 2018
- Best Paper Award in IEEE Computer Society Annual Symposium on VLSI *(ISVLSI),* Bochum, Germany, 2017
- Best Poster Award (1st place), Ph.D. Forum at Design Automation Conference, San Francisco, CA, USA, 2018
- Best Paper Nomination in Design Automation Conference (*DAC*), 2021
- Best Paper Candidate in Asia and South Pacific Design Automation Conference (*ASPDAC*), Tokyo, Japan, 2019
- Best Paper Candidate in International Symposium on Quality Electronic Design (*ISQED*), Santa Clara, CA, 2019
- Schloss Dagstuhl - NSF Award for Junior Researchers, 2019
- Front Cover Paper in *IEEE Transactions on Magnetics, Vol. 54, No.2, Feb. 2018*
- Outstanding Faculty Mentor Award Nomination of ASU Graduate College, 2020-21

Service activities (within and outside of the institution)

- Guest Editor for **3** peer-reviewed journals (3 special issues)
- **29** International/national conferences committees

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- **11** International/national conferences sessions organized
- **15** International/national conference sessions chaired
- Member of Editorial Board **2**
- Peer Reviewer for **42** Journals
- Proposal Review Service for **6** Funding Agencies
- **1** Engineering School-level Committees and **1** Unit-level Committees.

Briefly list the most important publications

- Invited Conference Papers: **19** (do not duplicate Abstract)
- Refereed Conference Papers: **64** (do not duplicate Abstract)
- Total Journal Publications (Published, In Press, and /or Accepted): **37**
- Shaahin Angizi, Zhezhi He, An Chen and Deliang Fan, "Hybrid Spin-CMOS Polymorphic Logic Gate with Application in In-Memory Computing," *IEEE Transactions on Magnetics (TMAG)* , Volume: 56 , Issue: 2 , Feb. 2020
- Li Yang, Zhezhi He, Junshan Zhang and Deliang Fan, "KSM: Fast Multiple Task Adaption via Kernel-wise Soft Mask Learning" *IEEE/CVF Computer Vision and Pattern Recognition (CVPR)*, June 19-25, 2021
- Fan Zhang, Shaahin Angizi and Deliang Fan, "Max-PIM: Fast and Efficient Max/Min Searching in DRAM" *In: 58th Design Automation Conference (DAC)*, San Francisco, CA, Dec. 5-9, 2021
- Fan Yao, Adnan Siraj Rakin and Deliang Fan, "DeepHammer: Depleting the Intelligence of Deep Neural Networks through Targeted Chain of Bit Flips," *In 29th USENIX Security Symposium (USENIX Security 20)*, August 12-14, 2020, Boston, MA, USA
- Adnan Siraj Rakin, Zhezhi He and Deliang Fan, "TBT: Targeted Neural Network Attack with Bit Trojan," *2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, June 16-18, 2020, Seattle, Washington, USA
- Complete publication list in https://dfan.engineering.asu.edu/

Briefly list the most recent professional development activities

- Mentored Personnel in US Academia (Tenure-track Positions): **1**
- PhD Students Graduated: **2**
- PhD Students Current: **4** (two passed PhD qualify exam)
- M.S. Thesis Students Graduated: **1**
- Undergraduate Students: **4** (serving as senior design mentor)
- High-School Students: **1** (summer research internship in my research lab)
- Student Fellowships and Awards: **21** (details listed below)

ZHAOYANG FAN

Education:

- Ph.D. in Electrical Engineering, 2001
  Department of Electrical and Computer Engineering

  Northwestern University, Evanston, Illinois, USA

- M.E. in Nuclear Engineering, 1994
  Institute of Nuclear and New Energy Technology

  Tsinghua University, Beijing, China

- B.E. in Engineering Physics, 1991
  Department of Engineering Physics

  Tsinghua University, Beijing, China

Academic experience

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- Arizona State University, School of Electrical, Computer and Energy Engineering, Tempe, Arizona, USA.
  Professor, 2020 – Present

- Texas Tech University, Department of Electrical and Computer Engineering, Lubbock, Texas.
  Professor, 2018 – 2020;
  Associate Professor, 2014 – 2018;
  Assistant Professor, 2008 – 2014;
  Adjunct Professor in Physics, 2015 – 2020.

- Kansas State University, Department of Physics, Manhattan, Kansas, USA.
  Postdoctoral Research Associate, 2001 –2003
- Tsinghua University, Institute of Nuclear and New Energy Technology, Beijing, China.
  Research Scientist, 1994 –1996

Non-academic experience

- III-N Technology Inc.
  VP of Research, 2005 – 2007
  Senior Scientist, 2003 – 2005

Membership

- National Academy of Inventors, Senior Member
- Institute of Electrical and Electronics Engineers (IEEE), Senior Member
- American Society of Physics, Member

Awards

- The President's Innovation Award of Texas Tech University System, 2020.
- TechConnect Innovation Award, 2018
- Red Raider Inventor, Texas Tech University System, 2018
- Ed and Linda Whitacre Faculty Fellowship, 2017-2020
- Whitacre Engineering Research Award, 2016

Services

- Guest Editor of *Electronics* (2021)
- Editorial Board Member of Electronics (2019-)
- Guest Editor of *Materials* (2018)

Publications

- Wenyue Li, Shiqi Li, Ayrton A. Bernussi, Zhaoyang Fan, "3-D Edge-Oriented Electrocatalytic $NiCo_2S_4$ Nanoflakes on Vertical Graphene for Li-S Batteries", *Energy Material Advances* 2021, 2712391 (2021).
- Zhaoyang Fan, "High Frequency Supercapacitors and Methods of Making Same", U.S. Patent 10,923,293, (2020).
- Nazifah Islam, Md Nadim Ferdous Hoque, Wenyue Li, Shu Wang, Juliusz Warzywoda, Zhaoyang Fan, "Vertically edge-oriented graphene on plasma pyrolyzed cellulose fibers and demonstration of kilohertz high-frequency filtering electrical double layer capacitors", *Carbon*, 141, 523-530 (2019).
- Shiqi Li, Zhaoyang Fan, "Nitrogen-doped carbon mesh from pyrolysis of cotton in ammonia as binder-free electrodes of supercapacitors", *Microporous and Mesoporous Materials*, 274, 313-317, (2019).
- Nazifah Islam, Shu Wang, Juliusz Warzywoda, Zhaoyang Fan, "Fast supercapacitors based on vertically oriented MoS_2 nanosheets on plasma pyrolyzed cellulose filter paper", *Journal of Power Sources*, 400, 277-283 (2018).
- Nazifah Islam, Shiqi Li, Guofeng Ren, Yujiao Zu, Juliusz Warzywoda, Shu Wang, Zhaoyang Fan, "High-frequency electrochemical capacitors based on plasma pyrolyzed bacterial cellulose aerogel for current ripple filtering and pulse energy storage", *Nano Energy*, 40, 107-114 (2017).
- Shiqi Li, Guofeng Ren, Md Nadim Ferdous Hoque, Zhihua Dong, Juliusz Warzywoda, Zhaoyang Fan, "Carbonized cellulose paper as an effective interlayer in lithium-sulfur batteries", *Applied Surface Science*, 396, 637-643 (2017).
- Guofeng Ren, Shiqi Li, Zhao-Xia Fan, Juliusz Warzywoda, Zhaoyang Fan, "Soybean-derived hierarchical porous carbon with large sulfur loading and sulfur content for high-performance lithium-sulfur batteries",

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Journal of Materials Chemistry A 4, 16507-16515 (2016).

- Guofeng Ren, Md Nadim Ferdous Hoque, Jianwei Liu, Juliusz Warzywoda, Zhaoyang Fan, "Perpendicular Edge Oriented Graphene Foam Supporting Orthogonal TiO_2(B) Nanosheets as Freestanding Electrode for Lithium Ion Battery", *Nano Energy*, 21, 162-171 (2016)
- Md Nadim Ferdous Hoque, Mengjin Yang, Zhen Li, Nazifah Islam, Xuan Pan, Kai Zhu, Zhaoyang Fan, "Polarization and Dielectric Study of Methylammonium Lead Iodide Thin Film to Reveal its Nonferroelectric Nature under Solar Cell Operating Conditions", *ACS Energy Letters*, 1, 142–149 (2016).

Recent professional development activities

- 239th ECS Digital Meeting, May 30-June 3, 2021

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DOUG GARRITY

Education

BSEE, Electrical Engineering, Portland State University, 1986

MSEE, Electrical Engineering, University of Idaho, 1993

Ph.D., Electrical Engineering, Arizona State University, 2007

Academic experience

Arizona State university, faculty associate, part time teaching EEE527 and EEE627 – 2008 to present, part time

Non-academic experience

1986-1992 (full-time) – American Microsystems Inc. Analog/Mixed-Signal ASIC design

1992 to present (full-time) – Motorola/Freescale/NXP – Fellow of the Technical Staff, leading a team in the development of high-performance data converters for embedded applications ranging from electricity metering to cellular radios to automotive radar.

Certifications or professional registrations

Fellow IEEE

Current membership in professional organizations

Fellow IEEE

Honors and awards

Received ASU Ira A. Fulton Schools of Engineering 2019 Top Five Percent Faculty award. Received 2020 IEEE Phoenix Section Outstanding Engineering Educator Award. Named an IEEE Fellow in 2012. Named a Freescale Fellow (1 of 12 out of 21,000 employees). Named a Freescale Master Innovator. Named a Motorola Dan Noble Fellow (most prestigious recognition possible from Motorola) in 2003. Received the Motorola

Distinguished Innovator Award. Named as a member of the Motorola Science Advisory Board Associates in 1999. Received the Semiconductor Research Corporation (SRC) Mahboob Khan Award as Mentor of the Year in 2001 and 2013. Received the Motorola Liaison Bravo Award for Outstanding Mentoring Contributions to University Research

Service activities (within and outside of the institution)

Served on IEEE SSCS Fellow Evaluation Committee for 6 years and as Chairman for 1 year. Served on IEEE CAS Kirchhoff Award Committee for 4 years and as Chairman for 1 year.

Briefly list the most important publications and presentations from the past five years –

title, co-authors if any, where published and/or presented, date of publication or

presentation

Patents in the last 5 years (I have 47 issued patents):

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PAT. NO.	Title
1 10,651,811 **T**	Mismatch and reference common-mode offset insensitive single-ended switched capacitor gain stage with reduced capacitor mismatch sensitivity
2 10,359,469 **T**	Non-intrusive on-chip analog test/trim/calibrate subsystem
3 10,298,257 **T**	SNDR improvement through optimal DAC element selection
4 10,211,820 **T**	Clock generator for multi-channel analog to digital converter
5 10,069,507 **T**	Mismatch and reference common-mode offset insensitive single-ended switched capacitor gain stage
6 9,748,964 **T**	Multi-channel analog to digital converter

Publications

"Introduction to Sigma-Delta Analog-to-Digital Converters," Doug Garrity, 2019 IEEE Midwest Symposium on Circuits and Systems (MWSCAS) (invited tutorial

"Gs/s Analog-to-Digital Converters in Sub-16nm Process Technologies" IEEE International Conference on Electronics, Circuits & Systems from November 23-25, 2020.

Briefly list the most recent professional development activities

Served on IEEE SSCS Fellow Evaluation Committee for 6 years and as Chairman for 1 year. Served on IEEE CAS Kirchhoff Award Committee for 4 years and as Chairman for 1 year.

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STEPHEN M. GOODNICK

Professor and Deputy Director of ASU Lightworks

EDUCATION:

Ph.D.,   Electrical Engineering, Colorado State University, 1983

M.S.,   Electrical Engineering, Colorado State University, 1979

B.S.,   Engineering Science, Trinity University, Texas, 1977

ACADEMIC EXPERIENCE:

Arizona State University, Tempe, Arizona

- David and Darleen Ferry Professor of Electrical Engineering, 2018 - , full time
- Professor, Electrical Computer and Energy Engineering, 1996 - 2018, full time
- Deputy Director, ASU Lightworks, 2011 - , part time
- Director of the Arizona Initiative for Renewable Energy, 2007-2010, part time
- Associate Vice President for Research, Arizona State University, 2006-2008, full time
- Director Arizona Institute of Nanoelectronics, 2006-present, part time
- Interim Deputy Dean, Ira A. Fulton School of Engineering, 2005-2006, full time
- Chair and Professor, Dept. of Electrical Engineering, 1996-2005, full time

Oregon State University, Corvallis, Oregon

- Professor, 1993-1996, full time
- Associate Director, NSF Center for the Design of Analog-Digital ICs, 1993-1994, part time
- Associate Professor, 1990-1993, full time
- Melchor Visiting Chair, University of Notre Dame, Fall 1991, full time
- Assistant Professor, Oregon State University, 1986-1990, full time

Technical University of Munich, Munich, Germany

- Hans Fischer Senior Fellow, Institute for Advanced Study, 2013- , part time
- Alexander von Humboldt Research Fellow, 1995, part time
- Alexander von Humboldt Research Fellow, 1986, full time

NON-ACADEMIC EXPERIENCE:

Visiting Professional, Solar Energy Research Institute, 5/85-8/85, full time

Visiting Professional, Sandia National Laboratories, Albuquerque, NM, 9/94-2/95, full time

PROFESSIONAL MEMBERSHIPS

- Institute of Electrical and Electronic Engineers, IEEE (m 1987; sm 1990; f 2004)
- American Physical Society (member, 1983-present)
- Materials Research Society
- Electrical and Computer Engineering Department Heads Association (1996-2006)
- American Society of Engineering Education (ASEE) (1999-present).
- American Association for the Advancement of Science (AAAS) (2001-present)

HONORS AND AWARDS

- Distinguished Educator Award from the IEEE Microwave Theory and Techniques Society, 2021
- IEEE-HKN Distinguished Service Award, 2018
- Hans Fischer Senior Fellow, Technical University of Munich Inst. for Advanced Study, 2013-2017
- IEEE Microwave Theory and Techniques Society, Certificate of Recognition 2002, 2015

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- IEEE Region 6 Outstanding Educator Award, 2013
- IEEE Phoenix Section Outstanding Faculty Award, February 9th, 2013
- ASEE ECE Division Meritorious Service Award, 2012
- R. M. Janowiak Outstanding Leadership and Service Award, ECEDHA, 2008.
- Fellow, IEEE, 2004
- IEEE Phoenix Section, Service Award, 2002
- Colorado State University College of Engineering Achievement in Academia Award, 1998
- College of Engineering Research Award, Oregon State University, 1996
- Alexander von Humboldt Research Fellow, Federal Republic of Germany 1986
- Eta Kappa Nu National Electrical Engineering Honor Society 1992

SERVICE ACTIVITIES

- Editor in Chief, Journal of Computational Electronics.
- ECEDHA Liaison, Inclusive Engineering Consortium (IEC), 2019-2020.
- Co-Chair (with Neal Armstrong, UA, and Thomas Acker, NAU), Arizona Student Energy Conference (AzSEC), Virtual, Oct. 28-30, 2020.
- Local Arrangements Chair, Workshop on Innovative Nanoscale Devices and Systems (WINDS), Kohala, Hawaii, Dec. 1-Dec. 6, 2019.
- Local Arrangements Chair, International Workshop on Computational Nanotechnology, Evanston, Illinois, May 20-24, 2019.
- Local Arrangements Chair, Workshop on Innovative Nanoscale Devices and Systems (WINDS), Kohala, Hawaii, Nov. 26-Nov. 30, 2018.
- Co-Chair (with Neal Armstrong, UA, and Thomas Acker, NAU), Arizona Student Energy Conference (AzSEC), Biosphere 2, Nov. 7-9, 2018.
- Vice-Chair, 2015 IEEE MTT-S International Microwave Symposium, Phoenix, AZ, May 18th-21st, 2015.
- President, IEEE Nanotechnology Council, 2012-2013.
- President, Board of Directors, International Engineering Consortium (IEC), 2009-2019.
- President, IEEE Eta Kappa Nu Board of Governors, 2011-2012.
- President, ECE Department Heads Association (ECEDHA), 2003-2004
- IEEE MTT Liaison to the IEEE Nanotechnology Council, 2009-2010.
- General Chair, IEEE Si Nanoelectronics Workshop, Honolulu, June 2010.
- Program Chair, Ninth IEEE Conference on Nanotechnology, Genoa, Italy, August 2009
- Personnel Committee, ECEE
- Chair of the Devices, Modeling and Processing/Photonics/PVsearch committee, ECEE
- Faculty Advisor, Epsilon Beta Chapter, IEEE-Eta Kappa Nu, ECEE

SELECTED PUBLICATIONS AND PRESENTATIONS IN THE LAST FIVE YEARS:

- R. V. Meidanshahi, C. Zhang, Y. Zou, C. Honsberg, Stephen M. Goodnick "Electronic structure of GaP/Si(001) heterojunctions and the role of hydrogen passivation," *Progress in Photovoltaics* 27, 724-732 (2019).
- R. Hathwar, Y. Zou, C. Jirauschek, and S. M. Goodnick, "Nonequilbrium electron and phonon dynamics in advanced concept solar cells," Topical Review in Journal of Physics D: Applied Physics 52, 093001 (22pp) (2019).
- N. Vulic and S. M. Goodnick, "Analysis of recombination processes in polytype gallium arsenide nanowires," Nano Energy 56, 196-206 (2018).
- J. J. Williams, H. McFavilen, A. M. Fischer, D. Ding, S. Young, E. Vadiee, F. A. Ponce, C. Arena, C. B. Honsberg, and S. M. Goodnick, "Refractory $In_xGa_{1-x}N$ Solar Cells for High Temperature Applications," IEEE Journal of Photovoltaics 7(6), 1646-1652 (2017).
- D. Vasileska, S. M. Goodnick, and G. Klimeck, Computational Electronics: Semi-Classical and Quantum Device Modeling and Simulation, (Taylor and Francis, UK, 600 pages) 2010.
- D. K. Ferry, S. M. Goodnick, and J. Bird, Transport in Nanostructures, (Cambridge University Press, 2nd Ed. 2009, 1st. Ed. 1997).

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RECENT PROFESSIONAL DEVELOPMENT:

- IEEE International Microwave Symposium, Atlanta, GA, June 7-10, 2021
- SPIE Photonics West, San Francisco, CA, February 4-6, 2020
- Workshop on Innovative Nanoscale Devices and Systems (WINDS), Kohala, Hawaii, Dec. 1-Dec. 6, 2019.
- International Workshop on Computational Nanotechnology, Evanston, Illinois, May 20-24, 2019.

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MICHAEL GORYLL

Education
PhD, Physics, RWTH Aachen, Germany, 2000
Diplom, Physics, RWTH Aachen, Germany, 1997

Academic Experience
Arizona State University, Associate Professor, Electrical Engineering, 2013-present, full time
Arizona State University, Assistant Professor, Electrical Engineering, 2007-2013, full time
Arizona State University, Post-doctoral Research Associate, Electrical Engineering, 2003-2005, full time

Non-Academic Experience
Research Centre Jülich, Germany, Post-doctoral Research Associate, Electrical Engineering, 2005-2007, full time
Research Centre Jülich, Germany, Post-doctoral Research Associate, Electrical Engineering, 2001-2003, full time

Current membership in professional organizations
Biophysical Society (BPS), Member
Institute for Electrical and Electronics Engineers (IEEE), Senior Member
Material Research Society (MRS), Member

Honors and Awards
Fulton Schools of Engineering, Best Teacher award, 2012
NSF CAREER award, 2011

Service activities
Ira A. Fulton Schools of Engineering, Academic Standards Committee, 2021-present
Ira A. Fulton Schools of Engineering, Academic Curriculum Committee, 2018-2020
Ira A. Fulton Schools of Engineering, FURI/MORE Review Committee, 2016-2020
School of Electrical, Computer and Energy Engineering, Undergraduate Program Chair, 2013-2016
School of Electrical, Computer and Energy Engineering, Undergraduate Curriculum Committee, 2013-present
School of Electrical, Computer and Energy Engineering, Undergraduate Scholarship Committee, 2013-present
Arizona State University, Student Organization Advisor for Sun Devil Satellite Lab, 2019-present
National Science Foundation, Reviewer for EECS and IIP directorates, 2008-present

Most important publications and presentations
S. Murali, C. Zhang, M. Goryll, R. R. King, and C. B. Honsberg, *"Study of pit formation in MBE grown GaP on misoriented Si,"* Journal of Vacuum Science and Technology B: Nanotechnology and Microelectronics, **38**(3), 2020, art. no. 032201.

A. Chikhalkar, M. Goryll, W. Shafarman, and R. R. King, *"Study of wavelength-resolved light-induced metastable defects in (Ag,Cu)(In,Ga)Se$_2$ thin-films using capacitance based methods,"* 46th IEEE Photovoltaic Specialists Conf., Chicago, IL, June 16-21, 2019.

M. Goryll, T. J. Thornton, C. Wang, S. M. Phillips, and D. Allee, *" Online Undergraduate Laboratories in Electrical Engineering"* in 2019 IEEE Frontiers in Education Conference (FIE), Cincinnati, OH, 16-19 Oct. 2019.

A. Spanias, J. M. B. Christen, T. J. Thornton, K. S. Anderson, M. Goryll and H. M. Arafa, U. S. Shanthamallu, E. S. F. Forzani, W. M. Barnard and S. Ozev, *"The sensor signal and information processing REU site"* In 2018 ASEE Annual Conference and Exposition, 2Salt Lake City, UT, June24-27, 2018.

A. Mahmud, Y. Gonzalez-Velo, M. Saremi, H. J. Barnaby, M. N. Kozicki, K. E. Holbert, M. Mitkova, T. L. Alford, M. Goryll, W. Yu, D. Mahalanabis, W. Chen, N. Chamele, and J. Taggart, *"Flexible Ag-ChG Radiation Sensors: Limit*

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of Detection and Dynamic Range Optimization Through Physical Design Tuning", IEEE Transactions on Nuclear Science, **63**, 2016, pp 2137-2144

N. Raravikar, A. Dobos, E. Narayanan, T. Sai Pavan Grandhi, S. Mishra, K. Rege, and M. Goryll, *"Investigation into Pseudo-Capacitance Behavior of Glycoside-Containing Hydrogels"*, ACS Appl. Mater. Interfaces **9**, 2017, pp 3554−3561

Most recent professional development activities
Ira A. Fulton Schools of Engineering, KEEN Project Faculty/REML, 2019-present

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OLIN L. HARTIN

2. Education – degree, discipline, institution, year

Ph.D. Electrical engineering, University of Texas at Austin, 1998

3. Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate),

when (ex. 2010 - 2014), full time or part time

ASU, Professor of Practice, 2015-current, full time

4. Non-academic experience – company or entity, title, brief description of position, when

(ex. 2014 – 2019), full time or part time

Shell Oil US 1979-1992, Senior Staff Geophysicist, full time

University of Texas, Research Assistant, 1994-1998

MOT,Freescale,NXP, 1998-2015, Manager Device Physics and Simulation Group

5. Certifications or professional registrations

IEEE senior member

APS member

6. Current membership in professional organizations

Above

7. Honors and awards

Don't keep track

8. Service activities (within and outside of the institution)

No list

9. Briefly list the most important publications and presentations from the past five years –

title, co-authors if any, where published and/or presented, date of publication or

presentation

Lecture assignment, doesn't require research, research done mainly before joining ASU

10. Briefly list the most recent professional development activities

Not sure what this means?

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GERALD THOMAS HEYDT

PhD Honoris Causa, Universitatea Politehnica din Bucureşti, 2019

PhD, Purdue University 1970

MSEE, Purdue University 1965

BEEE, Cooper Union 1963

Academic experience:

Regents' Professor Emeritus, Arizona State University 2019 - date

Regents Professor, Arizona State University, 2002 - 2019

Professor, Arizona State University, 1995 – 2002

Visiting Professor of Electrical Engineering, University of Nevada, Reno, 1994 - 1995

Professor, Purdue University, 1980 – 1995

Associate Professor, Purdue University 1975- 1980

Assistant Professor, Purdue University 1970- 1975

Non-academic experience:

Program Manager, National Science Foundation, 1990 - 1991

Certifications:

Registered Professional Engineer (Indiana)

Registered Professional Engineer (New Jersey)

Current membership in professional organizations:

Life Fellow, IEEE

Honors and awards

Standard Oil of Indiana Award for Excellence in Teaching, 1971.
Tau Beta Pi Award for Excellence in Teaching, 1971.
Eta Kappa Nu Award for Excellence in Teaching, 1971.
D. D. Ewing Award, Purdue University, 1978.
Listed in "American Men and Women of Science"
Purdue Student Association, "Best Teacher," November 1979.
Edison Electric Institute, Power Engineering Educator of the Year, 1989.
Erskine Fellow Award, University of Canterbury, Christchurch, New Zealand, 1990.

Fellow of IEEE "For leadership in electric power engineering education and research on harmonic signals in electric power systems" (1991).

IEEE 1995 Outstanding Power Engineering Educator, July 1995.

National Academy of Engineering of the United States, 1997

Distinguished Overseas Scientist, Cyprus Research Promotion Foundation, 2007.

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IEEE 2010 Richard H. Kaufmann Award, "For contributions to electric power quality, and transmission and distribution engineering."

ASU Founder's Day Faculty Service Awardee, 2018.

Samples of recent publications:

G. T. Heydt, "The probabilistic evaluation of net present value of electric power distribution systems based on the Kaldor-Hicks compensation principle," *IEEE Transactions on Power Systems*, v. 33, No. 4, pp. 4488 – 4495, July, 2018.

G. T. Heydt, "Thévenin's theorem applied to the analysis of polyphase transmission circuits," *IEEE Transactions on Power Delivery*, v. 32, No. 1, February, 2017, pp. 72 – 77.

G. T. Heydt, "An electric energy backbone overlay for North America," *Journal of Electric Power Components and Systems,* Volume 46, No. 8, August, 2018, pp. 1 – 9, DOI: 10.1080 / 15325008.208.151109.

Gerald Thomas Heydt, "Fifth harmonic spectral voltage components in EHV power transmission systems," *IEEE Transactions on Power Delivery*, 2021.

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KEITH E. HOLBERT

Education

Ph.D., Nuclear Engineering, University of Tennessee, 1989

M.S., Nuclear Engineering, University of Tennessee, 1986

B.S., Nuclear Engineering, University of Tennessee, 1984

Academic Experience

2008-Present   Director, Nuclear Power Generation program, Arizona State University

1997-2004   Associate Chair for Undergraduate Studies, Arizona State University

1995-Present   Associate Professor, Arizona State University, full-time

1989-1995   Assistant Professor, Arizona State University, full-time

Non-Academic Experience

2004-2005   Visiting Staff Member, Los Alamos National Laboratory, full-time

1996   Space Systems Technology Group, Motorola, full-time

Summer 1991   Battelle, Pacific Northwest Laboratory, full-time

1983-1987   Engineer, Analysis and Measurement Services Corporation, part/full-time

Registration/Licensing

- Registered Professional Engineer (Nuclear), Arizona License #31191

Professional Memberships

- IEEE Senior Member, 1996-present
- American Nuclear Society (ANS) Member, 1981-present

Honors and awards

- Top 5% Teaching Award, Fulton Schools of Engineering, 2021 and 2012
- PLuS Alliance, Fellow, 2020-2021
- ASEE Energy Conversion and Conservation Division, Second Best Paper, June 2016
- *IEEE Transactions on Education* Best Paper award for 2010
- Honorable Mention Paper Award, ASEE Continuous Improvement in Engineering Education Conference, March 2008
- Outstanding Faculty Award, IEEE Phoenix Section, February 2007
- Teaching Excellence Award from the ASU College of Engineering, 1996-1997
- Tau Beta Pi member (Tennessee Alpha, '84)

Institutional and Professional Service Activities (recent)

- Tau Beta Pi ASU Student Chapter Advisory Board, 1994-present
- Conference Session Chair, 52nd North American Power Symposium, virtual, April 2021

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- Editorial Board, Journal of Nuclear Engineering, 2020-present
- Associate Editor, journal of Science and Technology of Nuclear Installations, 2011-present
- Conference Session Chair, ASEE Rocky Mountain Section Conf., Sept. 30–Oct. 1, 2016
- Radiation Protection Committee, member, 2013-present
- University Undergraduate Standards Committee, 2017-2019

Principal Publications

1. V. Penmetsa, K. E. Holbert, "Climate Change Effects on Thermal Power Generation and Projected Losses in Generation and Income in the U.S. for the Period 2020–2050," *North American Power Symposium*, Tempe, AZ, April 11-14, 2021
2. K. E. Holbert, J. Fletcher, P. A. Burr, E. G. Obbard, "PLuS Alliance Nuclear Engineering Online Course Exchange Program," *Transactions of the American Nuclear Society*, vol. 122, virtual conference, June 8-11, 2020, pp. 43-45.
3. R. L. Murray, K. E. Holbert, *Nuclear Energy: An Introduction to the Concepts, Systems, and Applications of Nuclear Processes*, Eighth Edition, Elsevier Butterworth-Heinemann, print book ISBN 978-0-12-812881-7, ebook ISBN 978-0-12-812882-4, 624 pages, 2019.
4. G. G. Karady, K. E. Holbert, *Electrical Energy Conversion and Transport: An interactive computer-based approach*, Second Edition, IEEE Series on Power Engineering, Wiley Interscience, ISBN 978-0-470-93699-3, 854 pages, 2013.
5. K. E. Holbert, "Nuclear Reactors," *Kirk-Othmer Encyclopedia of Chemical Technology*, Wiley, 2017, 45 pp.
6. K. E. Holbert, A.S. Heger, P. J. Griffin, "Neutron and Secondary Gamma-ray Dose Uncertainty Quantification With Respect to Nuclide Neutron Cross-section Type and Energy," *Journal of Radiation Effects Research and Engineering*, vol. 37, no. 1, April 2019, pp. 101-109.
7. A. Dutta, K. E. Holbert, "Discrimination of Neutron-Gamma Ray Pulses with Pileup using Normalized Cross Correlation and Principal Component Analysis," *IEEE Transactions on Nuclear Science*, vol. 63, no. 6, December 2016, pp. 2764-2771.
8. B. C. Anderson, K. E. Holbert, H. Bowler, "Design, Construction, and Modeling of a 252Cf Neutron Irradiator," *Science and Technology of Nuclear Installations*, vol. 2016, Article ID 9012747, 12 pp.
9. K. E. Holbert, **T. Zhang**, "FREEDM Precollege Renewable Energy Program: Inspiring Young Adults to Recognize the Value of STEM Careers," *Proceedings of the 2016 American Society for Engineering Education Annual Conference & Exposition*, New Orleans, LA, June 26-29, 12 pp. (** Energy Conversion and Conservation Division *Second Best Paper*)
10. S. E. Arda, K. E. Holbert, "Nonlinear Dynamic Modeling and Simulation of a Passively Cooled Small Modular Reactor," *Progress in Nuclear Energy*, vol. 91, August 2016, pp. 116-131.
11. E. B. Johnson, C. Whitney, K. E. Holbert, T. Zhang, T. Stannard, A. Christie, P. Harper, B. Anderson, J. F. Christian, "Activation Analysis Study on Li-Ion Batteries for Nuclear Forensic Applications," *Nuclear Instruments and Methods in Physics Research* A, vol. 784, June 2015, pp. 430-437.

Professional Development Activities (recent)

- Consultant to Sandia National Laboratories
- FEMA Radiological Accident Assessment Workshop, December 2020

YOON HWA

Education

Ph.D. Materials Science and Engineering, Seoul National University, South Korea, 2013

B.S. Materials Science and Engineering, Sungkyunkwan University, South Korea, 2007

Academic experience

Arizona State University, Tempe, Assistant Professor, 2020-Present, Full time.

University of California Berkeley, Specialist, 2019-2020, Full time.

Lawrence Berkeley National Laboratory, Postdoc, 2015-2018, Full time.

University of California Berkeley, Postdoc, 2014, Full time.

Current membership in professional organizations

Electrochemical Society

International Society of Electrochemistry

American Chemical Society

Material Research Society

Korean American Scientists and Engineers Association

Honors and awards

ISE Travel Award for Young Electrochemist (International Society of Electrochemistry, 2016)

Spot Award (Lawrence Berkeley National Laboratory, 2016)

Service activities (within and outside of the institution)

Solar Power Laboratory Core Facility Governance Board (2021-Present)

Advanced Electronic and Photonics Core Facility Governance Board (2021-Present)

Co-organized the symposium 'Z02 - 4DMS+SoRo: 4D Materials & Systems + Soft Robotics' at the ECS PRIME 2020

Guest Editor: ECS Journal of Solid State Science and Technology, A focus issue in connection with the 4DMS+SoRo: 4D Materials & Systems + Soft Robotics Symposium (2020-2021)

Most important publications and presentations from the past five years

Y. Hwa, C. S. Kumai, T. M. Devine*, N. Yang, J. Yee, R. Hardwick & K. Burgman, Microstructure of Directed Energy Deposition-Additively Manufactured 316L Stainless Steel, J. Mater. Sci. Technol., (2021) 69, 96-105.

H. K. Seo§, **Y. Hwa**§, J. H. Chang, J. Y. Park, J. S. Lee, E. J. Cairns* & J. Yuk*, Direct visualization of lithium polysulfides and their suppression in liquid electrolyte, Nano Lett., 20, (2020) 2080-2086. §These authors contributed equally to this work

Y. Hwa§, H.-W. Kim§, H. Shen, D. Y. Parkinson, B. D. McCloskey & E. J. Cairns*, Sustainable sulfur-carbonaceous composite electrode toward high specific energy rechargeable cells, Mater. Horiz., 7, (2020) 524-529. §These authors contributed equally to this work.

Y. Hwa§, E. Yi§, H. Shen, Y. Sung, J. Kou, K. Chen, D. Y. Parkinson, M. Doeff* & E. J. Cairns*, Three-dimensionally aligned sulfur electrodes by directional freeze tape casting, Nano Lett., 19, (2019) 4731-4737. §These authors contributed equally to this work.

Y. Hwa, P. D. Frischmann, B. A. Helms* & E. J. Cairns*, Aqueous-processable redox-active supramolecular polymer binders for advanced lithium/sulfur cells, Chem. Mater., 30, (2018) 685-691.

Y. Hwa, H. K. Seo, J.-M. Yuk & E. J. Cairns*, Freeze-dried sulfur-graphene oxide-carbon nanotube nano-composite for high sulfur loading lithium/sulfur cells, Nano Lett., 17, (2017) 7086-7094.

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Y. Hwa, Microstructural Design Strategies of Sulfur Electrodes for High Specific Energy Lithium/Sulfur Cells, 239 ECS Spring Meeting, Invited Speaker, May 2021. Invited Speaker

Y. Hwa, Microstructure of additively manufactured and laser melted 316L stainless steel, TMS 2020 149th Annual Meeting and Exhibition. Oral Presentation

Y. Hwa, Rational design of sulfur-graphene oxide based electrode enabling high specific energy lithium/sulfur Cell, 14th Annual Lithium Battery Materials & Chemistries, Invited Speaker, Nov. 2018.

Y. Hwa, Li/S cells with cetyltrimethylammonium bromide modified sulfur-graphene oxide-carbon nanotube electrodes, The International Society of Electrochemistry, Aug. 2017, Invited Speaker.

Y. Hwa, High sulfur loading electrodes toward practical Li/S cells, American Chemical Society Spring Meeting, Apr. 2017, Oral Presentation

MOHAMMADREZA F. IMANI

Education:

PhD in Electrical Engineering from University of Michigan, Ann Arbor, USA (2013)

Academic experience:

- Assistant Professor, Arizona State University, (2020-present), full time
- Research Scientist, Duke University, (2018-2020), full time
- Postdoc Researcher, Duke University, (2014-2018), full time
- Postdoc Researcher, University of Michigan, (2013-2014), full time

Non-academic experience

- Metacept systems, Technical Advisor and Consultant, 2018-present, part time.

Current membership in professional organizations: IEEE (Member)

Honors and awards Duke University 2016 Postdoctoral Professional Development Award

Service activities (within and outside of the institution)

- Supervising 1 PhD student and mentoring two undergraduate students
- Technical Committee Member, 1st ACM International Workshop on Nanoscale Computing, Communication, and Applications (ACM NanoCoCoA 2020).
- Science Judge, NCSEF Region 3B fair, NC School of Science and Mathematics, Feb. 2020.
- Technical Reviewer: Nature Light: Science & Applications, Nature Communication, Scientific Reports, Applied Physics Letters, Journal of Applied Physics, IEEE Transactions on Antennas and Propagations, IEEE Antennas and Wireless Propagation Letters, IEEE Access, Optica, Photonics Research, Opt. Lett., Opt. Exp., Opt. Material Exp., JOSA B, Advanced Optical Materials, …

Briefly list the most important publications and presentations from the past five years

1. M. Boyarsky, T. Sleasman, **M. F. Imani**, J. N. Gollub, and D. R. Smith. "Electronically steered metasurface antenna." *Scientific reports* 11, no. 1 (2021): 1-10.
2. N. Shlezinger, G. C. Alexandropoulos, **M. F. Imani**, Y. C. Eldar, and D. R. Smith. "Dynamic Metasurface Antennas for 6G Extreme Massive MIMO Communications.", *IEEE Wireless Communication Magazine* (2021).
3. A. Oesterling, **M. F. Imani**, O. Mizrahi, J. N, Gollub, and D. R. Smith, "Detecting Motion in a Room Using a Dynamic Metasurface Antenna", *IEEE Access* 8 (2020), 222496-222505.

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4. **M. F. Imani,** D. R. Smith, and P. del Hougne. "Perfect Absorption in a Disordered Medium with Programmable Meta-Atom Inclusions." *Advanced Functional Materials* (2020): 2005310.

5. T. Sleasman, **M. F. Imani**, A. V. Diebold, M. Boyarsky, K. P. Trofatter, and D. R. Smith, "Implementation and characterization of a two-dimensional printed circuit dynamic metasurface aperture for computational microwave imaging", *IEEE Transactions on Antennas and Propagation*, vol. 69, no. 4, pp. 2151-2164, April 2021.

6. M. Boyarsky, **M. F. Imani**, and D. R. Smith, "Grating Lobe Suppression in Metasurface Antenna Arrays with a Waveguide Feed Layer", Opt. Express 28, 23991-24004 (2020).

7. A. Diebold, **M. F. Imani**, T. Fromenteze, D. Marks, and D. R. Smith, "Passive Microwave Spectral Imaging with Dynamic Metasurface Apertures", *Optica* 7, 527-536 (2020).

8. G. Lan, **M. F. Imani**, P. del Hougne, W. Hu, D. R. Smith, M. Gorlatova, "Wireless Sensing using Dynamic Metasurface Antennas: Challenges and Opportunities", accepted for publication, in *IEEE Communication Magazine*, 58, no. 6 (2020): 66-71.

9. **M. F. Imani**, J. Gollub, O. Yurduseven, A. V. Diebold, M. Boyarsky, T. Fromenteze, L. Pulido-Mancera, T. Sleasman, and D. R. Smith "Review of metasurface antennas for computational microwave imaging", *IEEE Trans. on Antennas and Propagation,* vol. 68, no. 3, pp. 1860-1875, March 2020.

10. **M. F. Imani** and David R. Smith, "Temporal Microwave Ghost Imaging Using a Reconfigurable Disordered Cavity", *Applied Physics Letters*, 116, no. 5 (2020): 054102.

11. P. del Hougne, **M. F. Imani**, A. V. Diebold, R. Horstmeyer, and D. R. Smith. "Learned Integrated Sensing Pipeline: Reconfigurable Metasurface Transceivers as Trainable Physical Layer in an Artificial Neural Network." *Advanced Science*, 1901913. 2019.

12. A. V. Diebold, **M. F. Imani**, T. Sleasman, and D. R. Smith, "Phaseless coherent and incoherent microwave ghost imaging with dynamic metasurface apertures", *Optica*, 5, 1529-1541 (2018).

13. **M. F. Imani***, T. Sleasman*, and D. R. Smith, "Two-dimensional dynamic metasurface apertures for computational microwave imaging", *IEEE Antennas and Wireless Propagation Letters*, vol. 17, no. 12, pp. 2299-2303, Dec. 2018

14. P. del Hougne, **M. F. Imani**, M. Fink, D. R. Smith, and G. Lerosey, "Precise localization of multiple non-cooperative objects in a disordered cavity by wavefront shaping", *Physical Review Letters*, 121, 063901, 2018.

15. P. del Hougne, **M. F. Imani**, T. Sleasman, J. Gollub, M. Fink, G. Lerosey, and D. R. Smith, "Dynamic Metasurface Aperture as Smart Around-the-Corner Motion Detector", *Scientific Reports*, 8, 6536, 2018.

16. L. Pulido-Mancera, P. Bowen, **M. F. Imani**, N. Kundtz, and D. R. Smith, "Polarizability extraction of complementary metamaterial elements in waveguides for aperture modeling." *Physical Review B.* 96(23):235402, 2017.

17. T. Sleasman, **M. F. Imani**, O. Yurduseven, K. P. Trofatter, V. R. Gowda, D. L. Marks, J. N. Gollub, and D. R. Smith, "Near Field Scan Alignment Procedure for Electrically-Large Apertures", *IEEE Transactions on Antennas and Propagation*, 65(6), 3257-62, 2017.

18. M. Boyarsky, T. Sleasman, L. Pulido-Mancer, T. Fromenteze, A. Pedross-Engel, C. M. Watts, **M. F. Imani**, M. Reynolds, and D. R. Smith, "Synthetic Aperture Radar with Dynamic Metasurface Antennas: A Conceptual Development", *JOSA A,* 34, A22-A36 March 2017.

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SAYFE KIAEI

Director, Connection One NSF Center, Motorola Chair in RF and Analog

Tel: (480)727-7761 ; Email: sayfe@asu.edu

EDUCATION:

Northeastern University/WSU	Electrical Engineering	B.S., 1982
Washington State University	Electrical and Computer Engineering	M.S., 1984
Washington State University	Electrical and Computer Engineering	Ph.D., 1987

ACADEMIC EXPERIENCE:

2001 – Present Professor of Electrical Engineering, Motorola Chair in Mixed-Signal   Analog/Digital IC

2002-present   Director, NSF IUCRC Center Connection One

2009-2012   Associate Dean for Research, Ira. A. Fulton Schools of Engineering, ASU

1998 - 1999   Adjunct Professor, ECE Dept., The University of Texas, Austin,

1988 - 1997   Co-Director, CDADIC, *NSF I/UCRC Center on Mixed-Signal IC's.*

1987 - 1995   Associate Professor, ECE Department, Oregon State University

1982 - 1987   Research & Teaching Assistant, Washington State University

NON-ACADEMIC EXPERIENCE:

1993 - 2001   IC Designer & Platform Manager, Senior Member of Technical Staff, Motorola.

1993 - 2001   Wireless Integration Technology Center, Austin, TX.

1985 - 1987   Member of Research Staff (Summer Intern position), Boeing Co.

PROFESSIONAL MEMBERSHIPS

IEEE Fellow, 2002-Present;

IEEE Fellow Committee Chair, CAS, 2008-2010; IEEE Fellow Committee member, 2007-2010;

HONORS AND AWARDS

- IEEE Darlington Award, IEEE Circuits and Systems Society Best Paper Award, 1995. For "Characterization and Comparison of CMOS FSCL Circuits with Conventional CMOS for mixed-signal ICs," Published at: *IEEE Trans. on Circuits and Systems II, Sept. 93*.
- Global Standards Award, For contributions in the International Telecommunication Unit (ITU) for Asymmetric Digital Subscriber Line (ADSL) G.Lite Standards. Motorola Inc., 1999.
- 10X Cycle Reduction Award, for development of new IC design process from DSP algorithm to IC layout, Motorola Inc., 1995.

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- Carter Best Teaching Award, College of Engineering Best Teacher Award, Oregon State University, 1992. For *"outstanding and inspirational teaching in the College of Engineering"*. Award is selected by the confidential vote of all of the undergraduate students in the College of Engineering among over 125 professors in the College.
- Industrial University Fellowship (IUF) Award, National *Science Foundation*, 1993.
- Research Initiation Award, *National Science Foundation*, 1990-93.

SERVICE ACTIVITIES

IEEE Microwave Magazine, Guest Editor, 2011; IEEE System Journal, Associate Editor, 2010-2011;

Associate Editor, IEEE Transactions on VLSI, Jan 2001-2008; IEEE Comm. Magazine,   IEEE Associate Editot, IEEE Transactions on Microwave Theory and Techniques

Editor, IEEE Transactions on Circuits and Systems-II , guest editor, Special Issue on: "Low-Power Wireless Communication Systems," June 1997;

Associate Editor, IEEE Transactions on Circuits and Systems-II, 1993-1996; *Editor*

RFIC Executive Committee members,   Steering Committee Member,   1996-2018.

SELECTED PUBLICATIONS AND PRESENTATIONS IN THE LAST FIVE YEARS:

1. Wideband Hybrid Envelope Tracking Modulator With Hysteretic-Controlled Three-Level Switching Converter and Slew-Rate Enhanced Linear Amplifier, P. Mahmoudidaryan; D. Mandal; B. Bakkaloglu; S. Kiaei, IEEE Journal of Solid-State Circuits, 2019.
2. Low-Power/Low-Voltage Integrated CMOS Sense Resistor-Free Analog Power/Current Sensor Compatible With High-Voltage Switching DC-DC Converter, S. Singh; D. Mandal; B. Bakkaloglu; S. Kiaei   IEEE Transactions on Circuits and Systems I, 2019
3. Adaptively Biased Output Cap-Less NMOS LDO With 19 ns Settling Time, D. Mandal; C. Desai; B. Bakkaloglu; S. Kiaei, IEEE Transactions on Circuits and Systems II: Express Briefs, 2019
4. Doohwang Chang ; Jennifer N. Kitchen ; Sayfe Kiaei ; Sule Ozev, In-field Recovery of RF Circuits from Wearout Based Performance Degradation, IEEE Transactions on Emerging Topics in Computing, 2018
5. Chengxi Liu ; Debashis Mandal ; Zhao Yao ; Ming Sun ; Jim Todsen ; Brian Johnson ; Sayfe Kiaei; Bertan Bakkaloglu, 50 V Isolation, 100 MHz, 50 mW Single-Chip Junction Isolated DC-DC Converter with Self-Tuned Maximum Power Transfer Frequency, IEEE Transactions on Circuits and Systems II, Sept 2018.

RECENT PROFESSIONAL DEVELOPMENT:

- RFIC Executive Committee members, 2000-present, Steering Committee Member, RFIC symposium, 1996-Present
- Technical Program Chair, IEEE International Sym. on Circuits and Systems, Phoenix, AZ, 2002;
- ISSCC Admin Council, Conferences Committee 2000-2005;

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RICHARD R. KING

Education

Ph.D.	Electrical Engineering	Stanford University	Stanford, CA	1990
M.S.	Electrical Engineering	Stanford University	Stanford, CA	1987
B.S.	Physics	Stanford University	Stanford, CA	1985

Academic experience

Arizona State University, Professor, 2015-present,

Full-time, School of Electrical, Computer and Energy Engineering.

Graduate Faculty: Department of Physics; School for Engineering of Matter, Transport, and Energy; School of Molecular Sciences.

Non-academic experience

- Spectrolab, Inc., Sylmar, CA, Boeing Division, Principal Scientist (final position), Technical Fellow, led research on high-efficiency multijunction solar cells, materials and characterization, 1997-2015, Full-time.
- Siemens Solar Industries, Camarillo, CA, Senior Research Scientist (final position), research on high-efficiency and cost-effective silicon solar cells and processes, 1992-1997, Full-time.
- Georgia Institute of Technology, Atlanta, GA, Research Engineer, research on high-lifetime silicon solar cell processes, 1990-1992, Full-time.
- Stanford University, Stanford, CA, Doctoral Researcher, research on doped silicon surface passivation and applications to solar cells, 1985-1990.

Honors and Awards

Elected Fellow of the Institute of Electrical and Electronics Engineers (IEEE) – 2017

- William R. Cherry Award – 2010   for "Outstanding Contributions to Photovoltaic Science and Technology," awarded at the 35th IEEE Photovoltaic Specialists Conference
- Boeing Silver Phantom Award – 2007, 2008
- R&D 100 Award, Spectrolab Team Leader – 2007
- Boeing S&IS World-Class Engineering Award – 2007
- Elected Boeing Technical Fellow – 2006
- Inducted into NASA/Space Technology Hall of Fame – 2004
- Scientific American 50 Award, Spectrolab Team Leader – 2002
- R&D 100 Award, Spectrolab Team Leader – 2001
- B.S. degree with Distinction, Departmental Honors, Phi Beta Kappa, Stanford University – 1985

Selected publications, 2016-2021

- S. R. Kurtz, A. Leilaeioun, R. R. King, I. M. Peters, M. J. Heben, W. K. Metzger, and N. M. Haegel, "Revisiting the Terawatt Challenge," *MRS Bulletin* **45**, 159-164 (2020).
- Augusto, J. Karas, P. Balaji, S. G. Bowden and R. R. King, "Exploring the practical efficiency limit of silicon solar cells using thin solar-grade substrates," *J. Mater. Chem. A* **8**, 16599 (2020).
- K. D. Tyler, M. K. Arulanandam, R. Pandey, N. Mohan Kumar, J. Drayton, J. R. Sites, and R. R. King, "Silicon Degradation in Monolithic II–VI/Si Tandem Solar Cells," *J. Photovolt.* **10**, 690-695 (2020).
- Chikhalkar, A. Gangopadhyay, H. Liu, C. Zhang×, F. A. Ponce, D. J. Smith, C. Honsberg, and R. R. King, "Investigation of polycrystalline $Ga_xIn_{1-x}P$ for potential use as a solar cell absorber with tunable bandgap," *J. Appl. Phys.* **127**, 073102 (2020), doi: 10.1063/1.5125676.
- S. R. Kurtz, A. Leilaeioun, R. R. King, I. M. Peters, M. J. Heben, W. K. Metzger, and N. M. Haegel, **"**Revisiting the Terawatt Challenge," *MRS Bulletin* **45**, 159-164 (2020).
- T. C. Narayan, L. Y. Kuritzky, D. P. Nizamian, B. A. Johnson, E. J. Tervo, B. M. Kayes, A. R. Young, E. E. Perl, C. Luciano, M. Limpinsel, M. K. Arulanandam, P. Santhanam, J. Slack, R. R. King, M. A. Steiner, D. J. Bierman, A. J. Ponec, J. A. Briggs, "World record demonstration of > 30% thermophotovoltaic conversion efficiency," *47th IEEE Photovoltaic Specialists Conf.*, Virtual Meeting, June 15-21, 2020.

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- N. P. Irvin, S. J. Babcock, E. Y. Chen, R. R. King, and C. B. Honsberg, "Benefits of Lambertian light distribution across widely deployed photovoltaic materials," *Proc. SPIE*, 2020, vol. 11275 (2020), *Proc. SPIE Photonics West*, San Francisco, CA, Feb. 2-7, 2020.
- Chikhalkar, M. Goryll, W. Shafarman, and R. R. King, "Study of wavelength-resolved light-induced metastable defects in (Ag,Cu)(In,Ga)Se$_2$ thin-films using capacitance based methods," *46th IEEE Photovoltaic Specialists Conf.*, Chicago, IL, June 16-21, 2019.
- Maros, N. N. Faleev, M. I. Bertoni, C. B. Honsberg and R. R. King, "Carrier localization effects in GaAs$_{1-x}$Sb$_x$/GaAs heterostructures,", *J. Appl. Phys.* **120**, 183104 (2016)*.
- R. M. France, F. Dimroth, T. J. Grassman, and R. R. King, "Metamorphic Epitaxy for Multijunction Solar Cells," *MRS Bulletin* **41**, 202-209 (2016), doi: 10.1557/mrs.2016.25.
- M. A. Steiner, J. F. Geisz, J. S. Ward, I. García, D. J. Friedman, R. R. King, P. T. Chiu, R. M. France, A. Duda, W. J. Olavarria, M. Young, S. R. Kurtz, "Optically enhanced photon recycling in mechanically stacked multijunction solar cells," *IEEE J. Photovolt.* **6**, 358-365 (2016), doi: 10.1109/jphotov.2015.2494690.
- Maros, N. Faleev, S. H. Lee, J. S. Kim, C. B. Honsberg, R. R. King, "1-eV GaNAsSb for Multijunction Solar Cells," *Proc. 43rd IEEE Photovoltaic Specialists Conf.*, Portland, Oregon, June 5-10, 2016.

Professional Development Activities

- Co-Founding Editor, IEEE Journal of Photovoltaics, 2010 - present. Archival scholarly journal devoted to photovoltaics within the IEEE family of publications.
- Research Director, NSF-DOE Quantum Energy and Sustainable Solar Technologies (QESST) Engineering Research Center, 2015 - present.
- Scientific Committee, European Photovoltaic Solar Energy Conf., 2012 - present.
- Scientific Advisory Board, Photonics at Thermodynamic Limits (PTL) EFRC, Stanford University, Stanford, CA, 2018 - present.
- Conference Chair, 40th IEEE Photovoltaic Specialists Conf., Denver, CO, 2014.
- Led over 100 top scientists in the field to organize this international conference on the science and technology of solar cells.

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JENNIFER KITCHEN

Professional Preparation

University of Arizona   Tucson, AZ   Electrical Engineering   B.S.E.E. 2002
Arizona State University   Tempe, AZ   Electrical Engineering   M.S.   2005
Arizona State University   Tempe, AZ   Electrical Engineering   Ph.D.   2007

Appointments

Aug 2012 – Present   Assistant Professor, Arizona State University
2009 – Aug 2012   Integrated Circuits and Systems Design Engineer, ViaSat, Inc.
2006 – 2009   Head of PA Design, Ubidyne, Inc.
2003 – 2006   RF Engineer, Freescale Semiconductor, Inc.
2002 – 2007   Graduate Research Assistant, Arizona State University

Products

Most Closely Related Products:

A. Hegde, Y. Long, J. Kitchen, "A Comparison of GaN-Based Power Stages for HighSwitching Speed Medium-Power Converters," *2017 IEEE Workshop on Wide Bandgap*

Power Devices and Applications (WiPDA), Oct. 2017

R. Welker, S. Ozev, and J. Kitchen, "Incorporating RF Test Measurements for Efficient

Design Flow of GaN-Based Power Amplifiers*," 2018 IEEE Topical Conference on RF/Microwave Power Amplifiers for Radio and Wireless Applications (PAWR)*, pp. 69-71, Jan. 2018.

J. Kitchen, D. Chang, J. Kitchen, S. Ozev, "Post-Production Adaptation of RF Circuits for Application-Specific Performance Metrics," *2016 IEEE International Symposium on Circuits and Systems (ISCAS)*, pp: 2775 – 2778, 2016.

M. R. Hasin, J. Kitchen, "Post Fabrication Tuning of GaN Based RF Power Amplifiers for Pico-Cell Applications," *2016 IEEE 34th VLSI Test Symposium*, April 2016.

M. Shafiee, J. Kitchen, and S. Ozev, "A Built-in Self-Test Technique for Transmitter-Only Systems," *2018 IEEE VLSI Test Symposium (VTS)*, pp. 1-6, March 2018.

Other Significant Products:

[Type here]

S. Moallemi, K. Grout, P. Mehr, T. Thornton, J. Kitchen, "Adaptive Power Control Using Current Adjustment for Watt-Level Power Amplifiers in CMOS SOI," IEEE Trans. on Circuits and Systems II: Express Briefs, early access, pp. 1-5, 2019.

M.R. Hasin and J. Kitchen, "Exploiting Phase for Extended Efficiency Range in Symmetrical Doherty Power Amplifiers", IEEE Transactions on Microwave Theory and Techniques (TMTT), early access, pp. 1-9, 2019.

J. W. Jeong, A. Nassery, J. N. Kitchen, S. Ozev, "Built-In Self-Test and Digital Calibration of Zero-IF RF Transceivers," IEEE Transactions on Very Large Scale Integration (VLSI) Systems, vol. 24, no. 6, pp. 2286-2298, 2016.

M. Javid, K. Ptacek, R. Burton, and J. Kitchen, "CMOS bi-directional ultra-wideband galvanically isolated die-to-die communication utilizing a double-isolated transformer," *2018*

IEEE International Symposium on Power Semiconductor Devices and ICs (ISPSD), pp. 8891, May 2018.

D. Chang, J. N. Kitchen, B. Bakkaloglu, S. Kiaei, S. Ozev, "Monitor-Based In-Field Wearout Mitigation for CMOS LC Oscillators," *IEEE Transactions on Device and Materials Reliability*, vol. 16, no. 2, pp. 183-193, 2016.

(d) Synergistic Activities

- Outreach: Technical Judge – Arizona FIRST LEGO League: Global robotics program to promote STEM in children ages 9-14. ASU Fulton School of Engineering High School Research Program: supporting high school students for on-campus summer research. Girls Have IT Day semi-annual middle school outreach program organizer and participant.
- Member Participation: Active Member of 4 IEEE professional societies, including IEEE SSCS Phoenix Chapter Publicity Chair.
- Committees and Chair: Technical Program Committee Member and Session Chair in 7
- IEEE conference committees, specifically serving as a Technical Program Committee Session Chair/Co-chair in Radio Frequency Integrated Circuits (RFIC) Symposium for the past four years.
- Technical Reviewer: Serving on 12 IEEE technical review panels for publications, including IEEE Journal of Solid State Circuits.
- Established Courses: RF Transceiver Circuits Design: curriculum enabling RF system and circuits design. This course is the only circuit course at ASU allowing a student to fabricate integrated circuits on silicon. Students enrolled: 75. Transmitters and Amplifiers: special topics course focusing on RF power amplifier design for wireless transmitters. Students enrolled: 50.

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MICHAEL N. KOZICKI

Professor

EDUCATION:

Ph.D., Electronics and Electrical Engineering, University of Edinburgh, 1985

B.Sc., Electronics and Electrical Engineering, University of Edinburgh, 1980

ACADEMIC EXPERIENCE:

Arizona State University, Tempe, Arizona

- Professor, Electrical, Computer, and Energy Engineering, 1996 – ; Interim/Founding Director of Entrepreneurial Programs, Fulton School of Engineering, 2003 – 2004; Director, Center for Solid State Electronics Research, 1997 – 2002, full time.
- Associate Professor, Electrical Engineering, 1991 – 1996, full time.
- Assistant Professor, Electrical Engineering, 1986 – 1991, full time.
- Laboratory Manager, Center for Solid State Electronics Research, 1985 – 1986, full time.

International

- Visiting Professor, Faculty of Science and Engineering, Univ. of Edinburgh, 2002 – 2020.
- Adjunct Professor, Gwangju Institute of Science and Technology, Korea, 2009 – 2012.

NON-ACADEMIC EXPERIENCE:

- Founder and Chief Technology Officer, Densec ID Corp. June 2021 – ; Founder and Chief Technology Officer, Axon Technologies Corporation. April 1996 – June 2017.
- Chief Scientist, Adesto Technologies, Sunnyvale, California, 2010 –2013.
- Project Engineer, Hughes Microelectronics Ltd., Glenrothes, U.K., 1983 – 1985, full time.
- Various consulting positions including Alcoa, Black and Veatch, Burr-Brown, Du Pont, ServiceMaster, 3M, Time-Warner, U.S. Army, Western Digital, 1985 – 1997.

PROFESSIONAL REGISTRATION

Chartered Engineer, United Kingdom/EU, 1988 – 2019

PROFESSIONAL MEMBERSHIPS

- National Academy of Inventors (NAI).
- Eta Kappa Nu (HKN).

HONORS AND AWARDS IN THE LAST FIVE YEARS

- Fellow, National Academy of Inventors - FNAI.
- Fulton Entrepreneurial Professor from 2016 to 2018.
- Daniel Jankowski Legacy Award 2019.
- Joseph C. Palais Distinguished Faculty Scholar Award 2019-2020.

SERVICE ACTIVITIES IN THE LAST FIVE YEARS

- Charter member of the ASU Academic Council.
- Member, International Advisory Board of the 4th International Conference on Emerging Materials, Technologies and Applications for Non-volatile Memory Devices, Forum on New Materials, International Conference on Modern Materials and Technologies (CIMTEC) 2020.
- Session Chair, International Conference on Memristive Materials, Devices & Systems (MEMRISYS), Dresden, Germany, July 8 – 11, 2019.
- Member of the Scientific Committee and Moderator, New Memory Paradigms: Memristive Phenomena and Neuromorphic Applications Faraday Discussion, Faraday Society, Royal Society of Chemistry, Aachen, Germany, October 15 - 17, 2018.
- Session chair, 14th International Conference on Modern Materials and Technologies CIMTEC 2018, Perugia, Italy, June 4 - 14, 2018.
- Panel member, The 2017 Stephen and Sharon Seiden Frontiers in Engineering & Science Workshop "Beyond CMOS: From Devices to Systems," Haifa, Israel, June 5-7, 2017.

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- Technical Program Committee Member, The American Ceramic Society, GOMD 2017.

SELECTED PUBLICATIONS/PRESENTATIONS IN THE LAST FIVE YEARS:

- M.B. Balaban, N. Chamele, S.S.Swain, Y. Gonzalez Velo, and M.N. Kozicki, "Fabrication and characterization of Cu_2O/Cu-WO_3 bilayers for lateral programmable metallization cells," Applied Surface Science, Vol. 527, 146899. DOI: 10.1016/j.apsusc.2020.146899 (2020).
- K.N. Subedi, K. Prasai, M.N. Kozicki, and D.A. Drabold, "Structural origins of electronic conduction in amorphous copper-doped alumina," Phys. Rev. Materials 3, 065605, DOI: 10.1103/PhysRevMaterials.3.065605 (2019).
- Z. Zhao, N. Chamele, M. Kozicki, Y. Yao, and C. Wang, "Photochemical synthesis of dendritic silver nano-particles for anti-counterfeiting," J. Mater. Chem. C, Vol. 7, 6099-6104, DOI: 10.1039/C9TC01473J (2019).
- Y. Gonzalez-Velo, H.J. Barnaby and M.N. Kozicki, "Review of radiation effects on ReRAM devices and technology," Semiconductor Science and Technology, vol. 32, issue 8, 083002 (2017).
- W. Chen, S. Tappertzhofen, H.J. Barnaby, and M.N. Kozicki, "SiO_2 based conductive bridging random access memory," Journal of Electroceramics, vol. 39, 109–131, https://doi.org/10.1007/s10832-017-0070-5 (2017).
- W. Chen, N. Chamele, Y. Gonzalez-Velo, H.J. Barnaby and M.N. Kozicki, "Low-Temperature Characterization of Cu–Cu: Silica-Based Programmable Metallization Cell," IEEE Electron Device Letters, vol. 38, issue 9, 1244-1247, DOI: 10.1109/LED.2017.2734743 (2017).
- I. Valov and M.N. Kozicki, "Non-volatile memories: Organic memristors come of age," Nature Materials, vol. 16, issue 12, 1170–1172 DOI:10.1038/nmat5014 (2017).
- M. N. Kozicki and H. J. Barnaby, "Conductive Bridging Random Access Memory – Materials, Devices and Applications," Semiconductor Science and Technology, vol. 31, no. 11, pp. 113001 (2016).

RECENT PROFESSIONAL DEVELOPMENT:

Information Security, ASU, 2020; Workplace Behavior, ASU, 2020

NAIM LOGIC

Education

Ph.D. – Electrical Engineering – Arizona State University - 2004

Academic experience

– Adjunct Faculty – 2019 – now – part time

- Graduate Research Associate and Teaching Assistant – 2002-2004 – part time

Non-academic experience

Salt River Project – Senior Electrical Engineer –

- Responsibilities for energy management system software improvement. Focus on power system state estimation and related mathematical tools for the power industry, application of synchronized phasor measurements, and power system reliability –

- 2004 – 2016 – full time

Certifications or professional registrations

- Professional Engineer - Electrical - certification awarded by the Arizona State Board of Technical Registration - 10/2002

- Certified Power Quality Professional - certification awarded by the Association of Energy Engineers - 02/1999

- Arizona Community Colleges Teaching certification - 02/2002

Current membership in professional organizations

- IEEE (The Institute of Electrical and Electronics Engineers) - Power and Energy Society (PES)

Senior Member since 2000

- NASPI (North American Synchrophasor Initiative) – member since 2005

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Honors and awards

- In 2011 as Phoenix Chapter Chairman, I got the IEEE PES Outstanding Chapter Award

- In 2013 I was nominated for Outstanding engineer of the year by IEEE PES Phoenix Chapter

Service activities (within and outside of the institution)

- Chairman of the Local Organizing Committee for the PSCE - Power Systems Conference and Exposition in Phoenix, AZ in 2011

- IEEE PES Region Chapter representative – 2012-2014

- IEEE PES Region representative – 2014-2019

- Chair of IEEE PES Industry-Focused Workshops Committee – 2020 - now

Most important publications and presentations from the past five years

title, co-authors if any, where published and/or presented, date of publication or

presentation

- "PMU Data Buffering for Power System State Estimators," - Veerakumar Murugesan, Yacine Chakhchoukh, Vijay Vittal, Gerald Heydt - IEEE   Power and Energy Technology Systems Journal, Vol. 2, No. 3, pp. 94-102, September 2015.

- "Electric Power Engineering Research and Education – A Festschrift for Gerald

T. Heydt – Chapter 5: Synchrophasor Measurements," – Elias Kyriakides, Siddharth Suryanarayanan, Vijay Vittal - Book published by Springer, ISBN 978-3-8383-3235-2, Saarbruecken, Germany, pp. 65-90, August 2015.

Recent professional development activities

- I initiated the Synchrophasor Team at SRP and performed a pioneering job in recognition of revolutionary synchrophasor technology and its implementation in the Smart Grid vision. This activity

also initiated 15 research projects with ASU as a part of Joint Research Program. Majority of these projects resulted in masters and doctoral theses at ASU.

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BASSAM MATAR

Education

MS in Electrical Engineering, Oklahoma State University, 1988

Academic experience – institution, rank, title (chair, coordinator, etc. if appropriate),

when (ex. 2010 - 2014), full time or part time.

Part time at ASU (2001 - Current). Full time at Chandler/Gilbert Community College. (1989 - current).

Non-academic

Design Engineer and Consultant, Various Assignments, Intel Corporation from 5/91 to 8/97 (part time).

- Revised and enhanced troubleshooting techniques and schematics for semiconductor manufacturing machines. Training department

- Revised and enhanced many data sheets for a variety of Intel micro-controller product.

- Worked with a group of engineers on Fuzzy Logic to enhance the use and applications of the Intel micro-controller

Honors and awards.

- (Summer 1999) Motorola Educator of the Year award

- (Spring 2000) National Institute for Staff and Organizational Development, EotY award

- (Fall 2009) Gilbert Community Excellence Awards, Educator of the Year award

- (Spring 2010) Electronic Engineering Times (EE Times) -- Educator of the Year award

Recent professional development activities

08/20-Current Program Manager and faculty for a new program/certificate in Artificial Intelligence and Machine Learning. Maricopa Community Colleges District, Workforce Office.

Co-developed and taught AIM 100: Introduction to Artificial Intelligence. Four more classes to be developed in the coming year. Leverage industry partnership needs. Lead the development and mapping of a new AAS and certificate in Artificial Intelligence and Machine Learning major program, in collaboration with Maricopa District Workforce and MCCCD Mapping Team. Lead the effort of a National Science Foundation (NSF) ATE grant around program and curriculum development, as well as outreach efforts.

RICO MEIER

Education

Dr. rer nat., Physics, Martin Luther University of Halle-Wittenberg, 2016

M. Sc., Physics, Leipzig University, 2008

Academic experience

Arizona State University, Assistant Research Prof., since 2018

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Non-academic experience

Head of Team Lifetime and Weathering, Fraunhofer Center for Silicon Photovoltaics CSP, 2017-2018

Research Associate, Fraunhofer Center for Silicon Photovoltaics CSP, 2008-2017

Certifications or professional registrations

Certified LabVIEW Associate Developer, 2018

Current membership in professional organizations

German Society for Non-Destructive Testing (DGZfP)

Honors and awards

Materials Award 2017 of Schott AG (translated), Advisory Board Meeting, Halle (Saale) , 2017

Best Student Paper Award in Structural Acoustics and Vibration, 164th Meeting of the Acoustical Society of America, Kansas City, 2012

Best Poster Award in Crystalline Silicon Photovoltaics, NREL 2011 PV Module Reliability Workshop, Golden, 2011

Service activities (within and outside of the institution)

Important publications and presentations from the past five years

R. Meier, M. Pander: "Methods for Material and Process Monitoring by Characterization of (Second and Third Order) Elastic Properties with Lamb Waves" , International Journal of Physical and Mathematical Sciences, Vol: 11 (8), pp. 361–367, 2017

R. Meier, M. Pander, S. Großer, S. Dietrich: "Microstructural optimization approach of solar cell interconnectors fatigue behavior for enhanced module lifetime in extreme climates" , Energy Procedia Vol. 92 (8), pp. 560–568, 2016

R. E. Kumar, G. v. Gastrow, J. Leslie, R. Meier, M. I. Bertoni and D. P. Fenning: "Quantitative Determination of Moisture Content in Solar Modules by Short-Wave Infrared Reflectometry", IEEE Journal of Photovoltaics, Vol: 9 (6), pp. 1748–1753, 2019

R. Meier: "Optimizing the Copper Ribbon Value Chain: A Use Case for Materials' Data Space and Total Design Management", Keynote Lecture at 7th International Conference on Nanoscience and Technology (ChinaNANO 2017): Nanotechnology Industry Forum, 2017

P. G. Coll, R. Meier, M. I. Bertoni: "Dynamics of Crack Propagation During Silicon Spalling" , In: Proceedings of the 7th World Conference on Photovoltaic Energy Conversion (WCPEC-7), pp. 2537–2539, 2018

R. Meier: "Ultrasonic Methods for Inline Solar Cell Interconnector Inspection: Overview, Applications and Limits", Proceedings of the 7th World Conference on Photovoltaic Energy Conversion (WCPEC-7), pp. 2229–2233, 2018

10. Briefly list the most recent professional development activities

Development of new methods for non-destructive material and component characterization in the field of quality assurance and production surveillance

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Microstructure manipulation and property design: Designing constitutive material or component properties (e.g. stress-strain relationship, fatigue properties, surface quality) by well-defined adjustment of the microstructure

Digitalization and holistic consideration and optimization of the product life cycle from raw material to recycling with focus on material properties: Multi-scale simulation of process-induced microstructure development for virtual material property design

DEIRDRE R. MELDRUM

Distinguished Professor of Biosignatures Discovery, Professor of Electrical Engineering, Director of Center for Biosignatures Discovery Automation

EDUCATION

- B.S. Civil Engineering, University of Washington, 1983
- M.S. Electrical Engineering, Rensselaer Polytechnic Institute, 1985
- Ph.D. Electrical Engineering, Stanford University, 1993
- Interpersonal Dynamics for High-Performance Executives, Stanford University, 2009
- Stanford Executive Program, Stanford Graduate School of Business, 2009

ACADEMIC EXPERIENCE

University of Washington, Seattle, WA

- Assistant Professor of Electrical Engineering, 1992 – 1998, full-time
- Founder and Director, the Genomation Laboratory, 1992 – 2006, full-time
- Adjunct Assistant Professor, Department of Bioengineering, 1997 – 1998, full-time
- Adjunct Associate Professor, Department of Bioengineering, 1998 – 2001, full-time
- Associate Professor with tenure, Department of Electrical Engineering, 1998 – 2001, full-time
- Adjunct Professor, Department of Bioengineering, 2001 – 2005, full-time
- Adjunct Professor, Department of Mechanical Engineering, 2001 – 2006, full-time
- PI and Director, NIH Center of Excellence in Genomic Sciences, 2001 – 2006, full-time

Arizona State University, Tempe, AZ

- Dean, Ira A. Fulton Schools of Engineering, 2007 – 2010, full-time
- Director, Biodesign Center for Ecogenomics, 2007 – 2010, full-time
- PI and Director, NIH Center of Excellence in Genomic Sciences, 2007 – 2013, full-time
- ASU Senior Scientist, 2011 – 2016, full-time
- Director, Center for Biosignatures Discovery Automation, 2011 – present, full-time
- Distinguished Professor of Biosignatures Discovery, 2007 – present, full-time
- Professor of Electrical Engineering, 2007 – present, full-time

NON-ACADEMIC EXPERIENCE

- Puget Sound Naval Shipyard, Design Engineer on ships and submarines, 1979, full-time
- NASA JSC, Shuttle Mission Simulator instructor for astronauts, 1980 – 1981, full-time
- Washington State Department of Transportation, Design Engineer on traffic control and transportation management systems, 1982 – 1983, part-time
- Jet Propulsion Laboratory/Caltech, Intern in Galileo Flight Test Group, Guidance and Control Section, tested Galileo flight hardware and software,1984, full-time
- Jet Propulsion Laboratory/Caltech, Member Technical Staff, Machine Intelligence Systems Group, Automated Systems Section, flexible structures and robotics, 1985 – 1987, full-time
- Exelixis Pharmaceuticals, Inc., Consultant on biotechnology automation, 1997 – 1999, part-time
- DOE Joint Genome Institute Scientific Advisory Board Member, 2000-2002, 2016-2018
- NIH, Office of the Director, Peer Review Oversight Group (PROG), 2000 – 2004, part-time
- NIH, National Human Genome Advisory Council, Member, 2006 – 2008, 2011 – 2014
- Climos, Inc., Member, Scientific Advisory Board, 2007 – 2011, part-time
- Microsoft Research, Member, Advisory Board, 2007 – 2013, part-time
- Swiss NSF Intl. Review Panel, SystemsX Program, Member, 2009 – 2011, part-time
- Northern Arizona Healthcare Foundation Board of Directors, Vice Chair, Director, and Chair of Grants and Awards, 2016-present, part-time

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CERTIFICATIONS OR PROFESSIONAL REGISTRATIONS

Engineer in Training (EIT), National Council of Examiners for Engineering and Surveying, 1983

CURRENT MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

- ACS Member (since 1999)
- AAAS Fellow (since 2003)
- IEEE Fellow (since 2004)
- AIMBE Fellow (since 2015)
- National Academy of Inventors (since 2017), 19 patents issued, 19 patents pending

HONORS AND AWARDS

- Fellow of AAAS, IEEE, AIMBE, and NAI
- Presidential Early Career Award for Scientists and Engineers (PECASE)
- NIH NCHGR (Human Genome) Special Emphasis Research Career Award (SERCA)
- PI and Director, the first NIH NHGRI Center of Excellence in Genomic Science (CEGS)
- UW Engineering Outstanding Faculty Award, Control Systems Laboratory and Curriculum
- Society of Automotive Engineers (SAE) Ralph R. Teetor Educational Award
- Chair, National Academy of Engineering, Grand Challenges Summit, Phoenix
- General Chair, IEEE Conference on Automation Science and Engineering (CASE)
- Founding Editor (1 of 4) & Sr. Editor, IEEE Transactions on Automation Science & Engineering
- Best paper of the year, IEEE Transactions on Automation Science and Engineering (T-ASE)
- Spansion Best Paper Award and Best Student Paper Award (advisor to student), IEEE CASE
- Distinguished Lecturer for IEEE Robotics and Automation Society
- Volunteer of the Year, Northern Arizona Healthcare Foundation

SERVICE ACTIVITIES (WITHIN AND OUTSIDE OF THE INSTITUTION)

- Director, ASU Center for Biosignatures Discovery Automation
- Member, IEEE Fellows EMBS Evaluation Committee
- Member, External Review Panel for the BIO5 Institute, University of Arizona, Tucson, Arizona
- Steering Committee Representative for IEEE Robotics and Automation Society (RAS) to IEEE Transactions on NanoBioscience (IEEE RAS Publications Activity Board)
- Participant, Organizing Committee, Plenary Speaker, and Panel Moderator, NIH NIAID, Workshop on Single Cell Technologies for Infectious Diseases, Washington DC, 2017
- Chair, Northern Arizona Healthcare Foundation Board Committee on Grants and Awards, created the entire grants application process and lead the annual Northern Arizona Community Health Grant Cycle, 2016 – present, reviewer 2018-2020

SELECTED PUBLICATIONS AND PRESENTATIONS

- "The oxindole Syk inhibitor OXSI-2 blocks nigericin-induced inflammasome signaling and pyroptosis independent of potassium efflux,"Jordan R. Yaron, Mounica Y. Rao, Sandhya Gangaraju, Liqiang Zhang, Xiangxing Kong, Fengyu Su, Yanqing Tian, Honor L Glenn, Deirdre R. Meldrum, Biochemical and Biophysical Research Communications, 472(3), 2016
- "Ratiometric fluorescent pH-sensitive polymers for high-throughput monitoring extracellular pH," Liqiang Zhang, Fengyu Su, Xiangxing Kong, Fred Lee, Kevin Day, Weimin Gao, Mary E. Vecera, Jeremy M. Sohr, Sean Buizer, Yanqing Tian, and Deirdre R Meldrum, RSC Advances, 6, pp. 46134-46142, 2016
- "Vorinostat differentially alters 3D nuclear structure of cancer and non-cancerous esophageal cells," Vivek Nandakumar, Nanna Hansen, Honor L. Glenn, Jessica H. Han, Stephanie Helland, Kathryn Hernandez, Patti Senechal, Roger H. Johnson, Kimberly J. Bussey, and Deirdre R. Meldrum, Scientific Reports 6:30593 (2016)
- "Transcriptional regulation by normal epithelium of premalignant to malignant progression in Barrett's esophagus," Jia Zeng, Laimonas Kelbauskas, Aida Rezaie, Kristen Lee, Benjamin Ueberroth, Weimin Gao, Dmitry Derkach, Thai Tran, Dean Smith, Kimberly J. Bussey, and Deirdre R. Meldrum, Scientific Reports, 6, 2016

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- "Improved performance of loop-mediated isothermal amplification assays via Swarm priming," Rhett Martineau, Sarah Murray, Shufang Ci, Weimin Gao, Shih-Hui Chao, and Deirdre R. Meldrum, Analytical Chemistry, 89(1), 2016
- "A platform for high-throughput bioenergy production phenotype characterization in single cells," Laimonas Kelbauskas, Honor Glenn, Clifford Anderson, Jacob Messner, Kristen B. Lee, Ganquan Song, Jeff Houkal, Fengyu Su, Liqiang Zhang, Yanqing Tian, Hong Wang, Kimberly Bussey, Roger H. Johnson, and Deirdre R. Meldrum, Scientific Reports, 7, 2017
- "Unlocking the photobiological conversion of CO2 to (R)-3-hydroxybutyrate in cyanobacteria," Bo Wang, Wei Xiong, Jianping Yu, Pin-Ching Maness, Deirdre R. Meldrum, Green Chemistry, 20(16), 2018
- "cRGD functionalized 2,1,3-benzothiadiazole (BTD)-containing two-photon absorbing red-emitter-conjugated amphiphilic poly(ethylene glycol)-block-poly(ε-caprolactone) for targeted bioimaging," Shanshan Wu, Fengyu Su, Hansa Y. Magee, Deirdre R. Meldrum, and Yanqing Tian, RSC Advances 9, 2019
- "Seriously Sensored!," EUROPT(R)ODE XIII, Invited Plenary Lecture, Graz, Austria, 2016
- "Single Cell Cellomics and Metabolomics for Predictive Health," International Conference on Single Cell Research, Invited Plenary Lecture, Tokyo, Japan, 2016
- "Biosignatures for the 21st Century," University of Southern California leadership, 2017

RECENT PROFESSIONAL DEVELOPMENT ACTIVITIES

ASU training: Biosafety, Lab Safety, Fire Safety, Information Security, Community of Care

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NICOLÒ MICHELUSI

Education

- Ph.D. degree in Electrical Engineering, University of Padova, Italy, 2013
- MSc degree in Telecommunications Engineering, University of Padova, Italy, 2009
- MSc degree in Telecommunications Engineering, Technical University of Denmark, 2009
- BSc degree in Electrical Engineering, University of Padova, Italy, 2006

Academic experience

- Assistant Professor (tenure-track), Arizona State University, January 2021 - current, full time
- Assistant Professor (tenure-track), Purdue University, January 2016 - Dec. 2020, full time
- Postdoctoral Research Associate, February 2013 - December 2015, University of Southern California, Los Angeles, CA, USA, full time
- Visiting Research Scholar, August - October 2012, Aalborg University, Denmark, full time
- Visiting Research Scholar, January - July 2011, University of Southern California, Los Angeles, CA, USA, full time

Current membership in professional organizations

- Senior member of IEEE
- Member of IEEE Communications Society (IEEE ComSoc)

Honors and awards

- NSF CAREER award (2021) "CAREER: Adaptive Communications and Trajectory Design for UAV-assisted Wireless Networks: a Multi-Scale Decision Framework" (PI, $487,688.00)
- NSF grant CNS-1642982 extension "Real-time Control of Dense, Mobile, Millimeter Wave Networks Using a Programmable Architecture" (2021) (PI, $50,000.00)
- NSF grant CNS-1642982 "Real-time Control of Dense, Mobile, Millimeter Wave Networks Using a Programmable Architecture" (2016-2021) (PI, $941,197.00)
- DARPA grant on the Spectrum Collaboration challenge (SC2) "Adaptive Wireless Networks for Spectrally Efficient Communications" (2016-2019) (co-PI, responsible for $397,561.00)
- Purdue "Seed for Success" Award 2017 and 2018 (DARPA-SC2)
- Toni Mian award, for best MSc Thesis in Information Engineering (2010) (euro 2,000)
- Isabella Sassi Bonadonna 2013 award, to support my research at a prestigious international research institute or university (2013) ($16,000 award)

Service activities

- Associate editor for the IEEE Transactions on Wireless Communications (Nov. 2016-current)
- Symposium Chair for the "Wireless Communications Symposium" at IEEE Globecom 2020
- Chair of "IoT, M2M, Sensor Networks, and Ad-Hoc Networking" track in the IEEE Vehicular Technology Conference 2020
- Symposium Chair for "Cognitive Computing and Networking" at ICNC 2018
- Organized an invited session at Asilomar'16 and one at Asilomar'17
- Technical Program Committee member for several IEEE and ACM conferences
- Reviewer for several IEEE Transactions

Publications and presentations from the past five years

- Tzu-Hsuan Chou, N. Michelusi, David Love, James Krogmeier, "Fast Position-Aided MIMO Beam Training via Noisy Tensor Completion," in IEEE Journal of Selected Topics in Signal Processing, vol. 15, no. 3, pp. 774-788, April 2021
- Chang-Shen Lee, N. Michelusi, Gesualdo Scutari, "Finite Rate Distributed Weight-Balancing and Average Consensus Over Digraphs," in IEEE Transactions on Automatic Control
- Muddassar Hussain, Maria Scalabrin, Michele Rossi, N. Michelusi, "Mobility and Blockage-aware Communications in Millimeter-Wave Vehicular Networks," IEEE Transactions on Vehicular Technology, vol. 69, no. 11, pp. 13072-13086, Nov. 2020
- M. Booth, V. Suresh, N. Michelusi, D. Love, "Multi-Armed Bandit Beam Alignment and Tracking for Mobile Millimeter Wave Communications," IEEE Communications Letters, vol. 23, no. 7, pp. 1244-1248, July 2019
- Y. Zhang, C.R. Anderson, N. Michelusi, D.J. Love, K.R. Baker, and J.V. Krogmeier, "Propagation Modeling Through Foliage in a Coniferous Forest at 28 GHz," in IEEE Wireless Communications Letters, vol. 8, no. 3, pp. 901-904, June 2019

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- N. Michelusi, M. Nokleby, U. Mitra, R. Calderbank, "Multi-Scale Spectrum Sensing in Dense Multi-Cell Cognitive Networks," in IEEE Transactions on Communications, vol. 67, no. 4, pp. 2673-2688, April 2019
- M. Hussain, N. Michelusi, "Energy-Efficient Interactive Beam Alignment for Millimeter-Wave Networks," in IEEE Transactions on Wireless Communications, vol. 18, no. 2, pp. 838-851, Feb. 2019
- N. Michelusi, "Optimal Spectrum Sharing with ARQ based Legacy Users via Chain Decoding", IEEE Transactions on Wireless Communications, vol. 17, no. 9, pp. 6122-6134, Sept. 2018
- J. Zhang, U. Mitra, H. Kuan-Wen, N. Michelusi, "Support Recovery from Noisy Random Measurements via Weighted L1 Minimization", IEEE Transactions on Signal Processing, vol. 66, no. 17, pp. 4527-4540, Sept. 2018
- N. Michelusi, P. Popovski, M. Zorzi, "Cognitive Access-Transmission Policies under a Primary ARQ process via Chain Decoding", IEEE Transactions on Information Theory, vol. 62, no. 12, pp. 7324-7357, Dec. 2016
- D. Del Testa, N. Michelusi, M. Zorzi, "Optimal transmission policies for two-user Energy Harvesting Device networks with limited state-of-charge knowledge", IEEE Transactions on Wireless Communications, vol. 15, no. 2, pp. 1393-1405, Feb. 2016

Briefly list the most recent professional development activities

Attended the Faculty Success Program from the National Center for Faculty Development and Diversity in the Spring of 2020.

STEVEN D. MILLMAN

EDUCATION

- Ph.D. EE, Stanford University, Palo Alto, CA 1990
- MS EE, Stanford University, Palo Alto, CA 1985
- AB Physics w/ Math minor, Occidental College, Los Angeles, CA 1984, Summa Cum Laude
- EE, The California Institute of Technology 1983-1984

ACADEMIC EXPERIENCE

- Mesa Community College, part-time faculty, 1990-1992
- Arizona State University, Lecturer 12/2018-7/2019
- Arizona State University, Professor of Practice 8/2019-present

NON-ACADEMIC EXPERIENCE

- Motorola/Freescale/NXP, 12/1989-11/2018 eventually became Technical Director

HONORS AND AWARDS

- 25 U.S. patents

SERVICE ACTIVITIES

- President, Temple Beth Sholom of the East Valley, 2014-2018
- Past President, Temple Beth Sholom of the East Valley, 2018-2020

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ARTHUR ONNO

Education

- PhD, Electronic and Electrical Engineering, University College London (UK), 2017
- MSc, Energy Engineering, Ecole Polytechnique (France), 2012
- MEng, Energy Engineering, ENSTA Paris (France), 2011
- BSc, Physics, Ecole Polytechnique (France), 2009

Academic experience

- Arizona State University, Assistant Research Professor, 2020–present, full time
- Arizona State University, Postdoctoral Research Scholar, 2017–2020, full time

Non-academic experience

- Total New Energies USA, Prospective technology analyst (technology scouting in the fields of solar energy and energy storage), 2012-2013, full time
- Total New Energies (France), Prospective technology analyst (technology scouting in the fields of solar energy), 2011, internship full-time
- Enedis (France), Energy optimization engineer (reducing energy waste in electrical substations), 2010-2011, internship part-time

Honors and awards

- ASU I-Corps Next Stage Training Lab Award, 2019
- European Photovoltaic Solar Energy Conference Student Award, 2017
- IEEE Photovoltaic Specialists Conference Best Student Presentation Award Finalist, 2017
- UCL EEE Cullen Prize for Best Research Student Poster, 2015

Service activities (within and outside of the institution)

- Tutorial Instructor, MRS Spring Meeting 2021, "Young Scientist Tutorial on Advanced Characterization Techniques for Thin-Film Solar Cells"
- Lead Organizer for the Holman Research Group Workshop on Physics of Solar Cells, 2019
- Session Chair, MRS Spring Meeting, 2018
- Special Section Guest Editor for SPIE Journal of Photonics for Energy—Special Section on Tandem Junction Solar Cells
- Reviewer for IEEE Journal of Photovoltaics, Solar Energy Materials and Solar Cells, Journal of Applied Physics, SPIE Journal of Photonics for Energy, ACS Applied Materials & Interfaces, The Journal of Physical Chemistry Letters
- Reviewer for IEEE Photovoltaic Specialist Conference (2019, 2020)

Important publications and presentations from the past five years

- Onno, C. L. Reich, S. Li, A. H. Danielson, W. Weigand, A. Bothwell, S. Grover, D. Kuciauskas, W. S. Sampath, and Z. C. Holman, "What limits the voltage of CdSeTe solar cells?" Manuscript in preparation.
- S. Kavadiya,* A. Onno,* C. Boyd,* X. Wang, A. Cetta, M. D. McGehee, and Z. C. Holman, "Investigation of the Selectivity of Carrier Transport Layers in Wide-Bandgap Perovskite Solar Cells," Solar RRL (2021), DOI: 10.1002/solr.202100107
- C. Boyd, R. C. Shallcross, T. Moot, R. Kerner, L. Bertoluzzi, A. Onno, S. Kavadiya, C. Chosy, E. J. Wolf, J. Werner, J. A. Raiford, C. de Paula, A. F. Palmstrom, Z. J. Yu, J. J. Berry, S. F. Bent, Z. C. Holman, J. M. Luther, E. L. Ratcliff, N. R. Armstrong, and M. D. McGehee, "Overcoming Redox Reactions at Perovskite-Nickel Oxide Interfaces to Boost Voltages in Perovskite Solar Cells," Joule 4(8), 1759–1775 (2020), DOI: 10.1016/j.joule.2020.06.004
- Onno,* N. Rodkey,* A. Asgharzadeh, S. Manzoor, Z. J. Yu, F. Toor, and Z. C. Holman, "Predicted power output of silicon-based bifacial tandem photovoltaic systems," Joule 4(3), 580–596 (2020), DOI: 10.1016/j.joule.2019.12.017
- S. Manzoor, M. Filipič, A. Onno, M. Topič, and Z. C. Holman, "Visualizing light trapping within textured silicon solar cells," Journal of Applied Physics 127(6), 063104 (2020), DOI: 10.1063/1.5131173

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- Leilaeioun, <u>A. Onno</u>, S. Manzoor, J. Shi, K. C. Fisher, Z. J. Yu, and Z. C. Holman, "Power Losses in the Front Transparent Conductive Oxide Layer of Silicon Heterojunction Solar Cells: Design Guide for Single-Junction and Four-Terminal Tandem Applications," IEEE Journal of Photovoltaics 10(2), 326–334 (2020) DOI: 10.1109/JPHOTOV.2019.2954765
- <u>Onno</u>, N.-P. Harder, L. Oberbeck, and H. Liu, "Simulation study of GaAsP/Si tandem solar cells," Solar Energy Materials & Solar Cells 145, 206–216 (2016), DOI: 10.1016/j.solmat.2015.10.028.

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ANAMITRA PAL

EDUCATION:

Ph.D., Electrical Engineering, Virginia Polytechnic Institute & State University (Virginia Tech), 2014

ACADEMIC EXPERIENCE:

(1) Arizona State University, Assistant Professor (08/2016 to present), full-time; (2) Virginia Tech, Applied Electrical and Computer Scientist (07/2014 to 07/2016), full-time; (3) Virginia Tech, Instructor (01/2014 to 05/2014), part-time

NON-ACADEMIC EXPERIENCE:

(1) Electric Power Group, LLC, USA, Summer Intern (05/2013 to 08/2013), full-time; (2) Electric Power Group, LLC, USA, Summer Intern (05/2012 to 08/2012), full-time; (3) Tata Steel Ltd., India, Manager: Electrical T&D (07/2008 to 06/2010), full-time; (4) Tata Steel Ltd., India, Summer Intern (05/2007 to 07/2007), full-time

5. Certifications or professional registrations: Future Professoriate Certificate (from Virginia Tech)

PROFESSIONAL MEMBERSHIPS:

IEEE Senior Member, Member of Tau Beta Pi

7. Honors and awards: (1) 2019 Outstanding IEEE Young Professional Award (IEEE Phoenix Section); (2) 2018 Young CRITIS Award (Best Young Researcher in Critical Infrastructure Protection); (3) Best New Employee of the Year (Tata Steel Ltd.); (4) Institute Gold Medal (Under-graduate)

SERVICE ACTIVITIES:

(1) Member of the Faculty Hire Search Committee in the Power System area (2017); (2) Faculty Advisor for the ASU student organization, Asha for Education (2019-2021); (3) Member of ASU's New Faculty Advisory Council (2019-current); (4) Member of NSF Review Panels (2017, 2020); (5) Technical Program Committee (TPC) member of 6 conferences (2017-2021); (6) IEEE Young Professional Chair of the IEEE Phoenix Section (2019-current); (7) Editor for the Journal of Modern Power Systems and Clean Energy (2020-2021); (8) Associate Editor for IEEE Transactions on Power Systems (2021-current)

SELECTED PUBLICATIONS AND PRESENTATIONS IN THE LAST FIVE YEARS:

Papers: (1) R. S. Biswas, A. Pal, T. Werho, and V. Vittal, "**Mitigation of saturated cut-sets during multiple outages to enhance power system security**," accepted for publication in *IEEE Transactions on Power Systems*. (2) R. S. Biswas, A. Pal, T. Werho, and V. Vittal, "**A graph theoretic approach to power system vulnerability identification**," *IEEE Trans. Power Syst.*, vol. 36, no. 2, pp. 923-935, Mar. 2021. (3) P. Gupta, A. Pal, and V. Vittal, "**Coordinated wide-area control of multiple controllers in a power system embedded with HVDC lines**," *IEEE Trans. Power Syst.*, vol. 36, no. 1, pp. 648-658, Jan. 2021. (4) K. Imran, J. Zhang, A. Pal, A. Khattak, K. Ullah, and S. M. Baig, "**Bilateral negotiations for electricity market by adaptive agent-tracking strategy**," *Electric Power Syst. Research*, vol. 186, pp. 1-12, Sep. 2020. (5) M. Padhee, A. Pal, C. Mishra, and K. A. Vance, "**A fixed-flexible BESS allocation scheme for transmission networks considering uncertainties**," *IEEE Trans. Sustainable Energy*, vol. 11, no. 3, pp. 1883-1897, Jul. 2020. (6) M. Padhee, R. S. Biswas, A. Pal, K. Basu, and A. Sen, "**Identifying unique power system signatures for determining vulnerability of critical power system assets**," *ACM SIGMETRICS Perform. Eval. Rev.*, vol. 47, no. 4, pp. 8-11, Apr. 2020. (7) C. Mishra, R. S. Biswas, A. Pal, and V. A. Centeno, "**Critical clearing time sensitivity for inequality constrained systems**," *IEEE Trans. Power Syst.*, vol. 35, no. 2, pp. 1572-1583, Mar. 2020. (8) A. Pal, A. K. S. Vullikanti, and S. S. Ravi, "**A PMU placement scheme considering realistic costs and modern trends in relaying**," *IEEE Trans. Power Syst.*, vol. 32, no. 1, pp. 552-561, Jan. 2017.

Presentations: (1) **ATAL Faculty Development Program of N.I.T. Calicut:** Invited to give a lecture on the "Application of Artificial Intelligence in Power System Operation and Control". My talk was titled "Time-Synchronized State Estimation for Incompletely Observed Distribution Systems" and was delivered remotely on November 9, 2020. (2) **Future Energy Forum at the 2nd World Young Scientist Summit:** Invited to give a talk on the theme

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"Sustainable Power Development amid the World's Energy Transition". My talk was titled "Time-Synchronized State Estimation for Incompletely Observed Distribution Systems" and was delivered remotely on October 17, 2020. (3) **Power Systems Engineering Research Center (PSERC) Webinar:** Invited to give a 1-hour webinar on "Coordinated Wide-Area Polytopic Control Design using Linear Matrix Inequality" on April 21, 2020. [Online]. Available: https://pserc.wisc.edu/webinars.aspx (4) **International Workshop on Critical Infrastructure Network Security (CINS):** Invited speaker at the 3rd International Workshop on CINS held in conjunction with ACM Sigmetrics on June 28, 2019

PROFESSIONAL DEVELOPMENT ACTIVITIES

(1) Organized an Industry Panel Session on the topic of "Emerging Challenges in the Modern Electric Grid" at the 2020 IEEE SmartGridComm held in Phoenix, AZ, in November 2020. (2) Organized a Student-Industry-Faculty Interaction (SIFI) Session at the 2020 IEEE SmartGridComm held in Phoenix, AZ, in November 2020. (3) Volunteer for the TryEngineering Together program of IEEE (an eMentorship program) to inspire and educate the next generation (grades 3 to 5) of engineers, scientists and technical professionals.

JOSEPH C. PALAIS

Education

(All in Electrical Engineering)

Ph.D.   University of Michigan,   1964
M.S.E.   University of Michigan,   1962
B.S.E.E.   University of Arizona,   1959

ACADEMIC EXPERIENCE

1973 - Present	Arizona State University, School of Electrical, Computer and Energy Engineering, Professor (Emeritus Professor since 2011),
1985 - Present	Graduate Program Chair, School of Electrical, Computer and Energy Engineering
2004 - Present	Academic Director, Online and Professional Programs, Ira A. Fulton Schools of Engineering
8/94 – 6/95	Acting Associate Dean, College of Engineering and Applied Sciences,
1988 - 2001	National Technological University, Instructional Faculty
1973	Technion - Israel Institute of Technology, Visiting Associate Professor
1968 - 1973	Arizona State University, Department of Electrical Engineering, Associate Professor
1964 - 1968	Arizona State University, Department of Electrical Engineering, Assistant Professor

NON-ACADEMIC EXPERIENCE

1967 - 1968	Sylvania, Engineering Specialist
1965 - 1966	Stanford Research Institute, Research Engineer (Summer)
1960 - 1964	University of Michigan, Cooley Electronics Lab., Assistant Research Engineer
1959 - 1960	Motorola, Microwave Engineer
1956 - 1958	Motorola, Electronics Technician

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CURRENT MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

2002 Life Fellow, Institute of Electrical and Electronic Engineers

1997 Fellow, Institute of Electrical and Electronic Engineers

1969 Chairman, Phoenix Combined IEEE Chapter on Antennas and Propagation, Electron Devices, and Microwave Theory and Techniques

1968 - 1972, Chairman of MTT Technical Committee on Optoelectronics and Holography

1990 - 1991, Member IEEE LEOS Committee on Education

1991 - 2001, LEOS Representative for Phoenix Section IEEE Waves and Devices Group

Optical Society of America

Society of Photo-Optical Instrumentation Engineers

IEEE Lasers and Electro-Optics Society

IEEE Education Society

ASEE

HONORS AND AWARDS

2007   Daniel Jankowski Legacy Award, Arizona State University, Ira A. Fulton Schools of Engineering

2001   IEEE Life Fellow

1999   Conferences and Professional Programs (CaPP) Faculty Service Award, University Continuing Education Association

1997   IEEE Fellow award for leadership and sustained contributions to university and continuous education, primarily in the area of fiber optic communications.

1993   IEEE Educational Activities Board Meritorious Achievement Award in Continuous Education for exemplary, sustained, and diverse contributions to continuing education primarily in the area of fiber optical communications

1989   Professor of Year, Industrial Fellows Program, Arizona State University

1974   IEEE Phoenix Section 1974 Annual Achievement Award for Contributions to Education, Academic and Industrial Research, and IEEE Technical Activities

1967   Ford Foundation Faculty Residency in Engineering Practice

Sponsored Research Fellowship, University of Michigan

Sigma Xi (member), Tau Beta Pi, Eta Kappa Nu, Pi Mu Epsilon, Phi Kappa Phi, American Men and Women of Science, Who's Who in the West, Who's Who in Technology, Who's Who in Optical Science and Engineering

SERVICE ACTIVITIES

1985 - Present   Graduate Program Chair, School of Electrical, Computer and Energy Engineering

2004 - Present   Academic Director, Online and Professional Programs, Ira A. Fulton Schools of Engineering

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ANTONIA PAPANDREOU-SUPPAPPOLA

Education:

PhD, Electrical Engineering, University of Rhode Island, 1995

Academic experience: Professor, School of Electrical, Computer and Energy Engineering (ECEE), Arizona State University (ASU), 2008-present

Current membership in professional organizations:

- Institute of Electrical and Electronics Engineers (IEEE)

- IEEE Signal Processing Society

- IEEE Society of Women Engineers (SWE)

Honors and awards:

- Fellow of the Institute of Electrical and Electronics Engineers (IEEE)

- IEEE Region 6 Affinity Group Individual Award for Women in Engineering, 2020

- IEEE Phoenix Section "Outstanding Contribution to Promoting Women in Engineering" Award, 2020

- Top 5% Fulton School of Engineering Teachers Teaching Excellence Award, 2009, 2018, 2021

- Fulton Exemplar Faculty Award, 2014 (for recognition to outstanding tenured and tenure-track faculty who are strong contributors to both the education and research missions of the Ira A. Fulton Schools of Engineering)

- Fulton School of Engineering Award, 2013; Fulton School of Engineering Teaching Excellence Award, 2005

- Honors Faculty, The Barrett Honors College, ASU (2008, 2012, 2019)

- NSF CAREER award (2002)

Service activities:

University Service: FSE Curriculum committee member (2020-present); ECEE Systems Area chair (2018-present) and member (1999-2018); ECEE Graduate committee chair (2011-present) and member (2005-2010); ECEE Undergraduate Award's committee chair (2017-present) and member (2003-2017); Biological Design Graduate Program member (2013-present); FSE General Scholarship committee member (2018); ECEE Academic Teaching Load committee (2018); ASU Faculty advisor of Fellowship of Faiths and Cultures Club (2016-2017); FSE Dean's Promotion and Tenure committee (2013–2015); FSE Research Advisory committee (2010–2011); FSE Quality of Instruction committee chair (2009-2010) and member (2004-2009); FSE Fulton Fellowship Steering committee (2005)

Professional Service: IEEE Signal Processing Society Women in Signal Processing committee chair (2014-2017), Membership Services committee member (2014-2017); Member-at-Large Board of Governors member (2010-2012); Treasurer of the Conference Board (2004-2006); and Technical Committee member (2003-2008); Chair of the IEEE Communications and Signal Processing Phoenix Chapter chair (1999-2001); guest editor in IEEE Signal Processing Magazine (2009); guest editor in IEEE Journal on Selected Topics in Signal Processing (2007); associate editor of IEEE Transactions on Signal Processing (2005-2009); associate editor of IEEE Signal Processing Letters (2003-2005); Technical area chair, special sessions chair, technical program technical review committee member for multiple IEEE conferences

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Most important publications and presentations (past five years):

- J. Zhou, A. Papandreou-Suppappola, and C. Chakrabarti, "Parallel Gibbs sampler for wavelet-based Bayesian compressive sensing with high reconstruction accuracy," *Journal of Signal Processing Systems,* vol. 92, pp. 1101-1114, 2020
- F. Solis and A. Papandreou-Suppappola, "Power dissipation and surface charge in EEG: Application to eigenvalue structure of integral operators," *IEEE Transactions on Biomedical Engineering*, vol. 67, no. 5, pp. 1232-1242, 2020
- J. A. Northrop and A. Papandreou-Suppappola, "Computationally efficient estimation of compound K-distributed sea clutter in thermal noise and its application to sea echo reflectivity observations," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 56, pp. 2340-2350, 2020
- J. S. Kota and A. Papandreou-Suppappola, "Joint design of transmit waveforms for object tracking in coexisting multimodal sensing systems," *Sensors, Special Issue Multiple Object Tracking: Making Sense of the Sensors* vol. 19, 2019
- S. Chakraborty, A. Banerjee, S. K. S. Gupta, P. R. Christensen, and A. Papandreou-Suppappola, "Estimation of dynamic land cover parameters for change detection in MODIS time-series, *Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 11, pp. 1769-1776, 2018
- M. Zhou, J. J. Zhang, A. Papandreou-Suppappola, "Multiple target tracking in urban environments," *IEEE Transactions in Signal Processing*, vol. 64, pp. 1270-1279, March 2016
- "How can Bayesian nonparametric methods, applied to machine learning problems, improve information learning in multimodal sensing under time-varying conditions?," AFOSR Science of Information, Computation, Learning and Fusion meeting, Boston, June 2019
- "Radar target tracking under varying environmental conditions, AFRL, September 2017

Most recent professional development activities:

- Participation in practice interviews for finalists for the Rhodes, Marshall, and Mitchell scholarships (2020)
- NSF panel reviewer (2020)
- Director of a minority student team project, sponsored by the Western Alliance to Expand Student Opportunities (WAESO) 2012

STEPHEN M. PHILLIPS

Professor of Electrical Engineering

Director of the School

School of Electrical, Computer and Energy Engineering

Arizona State University, Tempe, Arizona

EDUCATION:

- Ph.D., Electrical Engineering, Stanford University, 1988
- M.S., Electrical Engineering, Stanford University, 1985
- B.S., Electrical Engineering, Cornell University, 1984

ACADEMIC EXPERIENCE:

Arizona State University, Tempe, Arizona

- Professor and Director, Electrical Computer and Energy Engineering, 2009 – , full time
- Professor and Department Chair, Electrical Engineering, 2005 – 2009, full time
- Professor, Electrical Engineering, 2002 – 2005, full time

Case Western Reserve University, Cleveland, Ohio

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- Assistant, Associate, Professor of Electrical Engineering, 1988 – 2002, full time
- Director of the Center for Automation and Intelligent Systems, 1995 – 2002, part time

NON-ACADEMIC EXPERIENCE:

- Litton Guidance and Control, Woodland Hills, California; Electrical Engineer, 1985, full time

PROFESSIONAL REGISTRATION

- Registered Professional Engineer, Ohio, 1990-

PROFESSIONAL MEMBERSHIP

- IEEE senior member
- Eta Kappa Nu

HONORS AND AWARDS

- IEEE Vice President – Educational Activities 2020 –
- IEEE Board of Directors 2020 –
- ABET Board of Directors 2013-2015
- ABET board of Delegates 20015 – 2020
- President, Electrical and Computer Engineering Department Heads Association 2012-13
- Robert M. Janowiak Leadership and Service award, ECE Dept. Heads Assn, 2017
- IEEE Educational Activities Board, 2015 –

SERVICE ACTIVITIES

- ABET Program Evaluator 2007-2014
- IEEE Educational Activities, Treasurer 2019
- IEEE Committee on Engineering Accreditation Activities 2012-
- IEEE University Resources Committee 2012-
- Director of the School of Electrical, Computer and Energy Engineering, 2009 –
- Chair of the Department of Electrical Engineering, 2005-2009

SELECTED PUBLICATIONS AND PRESENTATIONS IN THE LAST FIVE YEARS:

- Michael Goryll, Trevor Thornton, Chao Wang, Stephen. M. Phillips, David Allee
  "Online Undergraduate Laboratories in Electrical Engineering,"
  Proceedings of the IEEE Frontiers in Education Conference, Cincinnati, 2019
- Chao Wang, Stephen. M. Phillips "Connecting Theory to Practice in an Online Introductory Signals and Systems Course," *Proceedings of the IEEE Frontiers in Education Conference*, San Jose, 2018
- Stephen M. Phillips, Marco Saraniti "A fully online accredited undergraduate electrical engineering program," *Proceeding of the ASEE Annual Conference and Exposition*, New Orleans, LA, 2016
- Stephen M. Phillips, Online Delivery of Engineering Programs: Tips You Can Use From an Experienced ABET-Accredited Program. IEEE virtual event, 8 April 2020
- Russel Meier, Stephen M. Phillips, Ece Yaprak, Reimagining the Student Experience virtual conference: Managing Remote Laboratories. IEEE virtual series, 28 July 2020.

RECENT PROFESSIONAL DEVELOPMENT:

- Strategies for Effective Delivery of Online Engineering Courses. Presented by Babak Beheshti, Dean, New York Polytechnic. IEEE virtual event 21 April 2020
- Engineering Education 2.0: Models, Methods and Techniques for Innovation, Presented by Arnold Pears, Chair of Learning in Eng. Science, KTH Sweden, 1 PDH 30 Sept 2020

IEEE virtual series on remote learning:

- Ditching the Traditional College Lecture in Remote Instruction, 1 PDH, 27 July 2020
- Managing remote Teams, 1 PDH 28 July 2020
- Making Labs Effective with Remote Learning, 1 PDH 29 July 2020
- Student Assessments for Remote Delivery, 1 PDH 30 July 2020
- Student and Data Privacy When Offering Remote Instruction, 1 PDH, 31 July 2020

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DAVID REGENOLD

Education

Associate Degree, Electronics, Tri-Cities State Regional Vocational-Technical School, 1977

Bachelor of Science, Electrical Engineering, University of Tennessee, 1982

Master of Science, Electrical Engineering, Georgia Institute of Technology, 1984

Post Baccalaureate, Teacher Prep Program, Rio Salado Community college, 2004

Academic experience

University of Phoenix, Online Math Instructor, 2003-2010, part time

Arizona State University, Faculty Associate, 2015-2020, part time

Non-academic experience

NASA, Intern, Ground Operations Hardware Validation, 1979-1991, Part time

General Electric Semiconductor, Design Engineer, digital/analog ASIC design, 1984-1987, full time

Intel Corporation, Design Engineer, digital processor design, 1987-2006, full time

Marvell Semiconductor, Senior Design Engineer, Memory & BIST design, 2006-2015, full time

ARM, Principal Engineer, Memory BIST design and Validation, 2015-2018, full time

Certifications or professional registrations

Associate Engineering Technician, The Institute for the Certification of Engineering Technicians, 1977

Engineer in Training, State of Tennessee, 1981

Current membership in professional organizations

Senior Member IEEE

Honors and awards

Intel Achievement Award

Service activities (within and outside of the institution)

Paper Reviewer for International Test Conference from 2017 through 2021

Important publications and presentations from the past five years

None within that time period. Currently retired from the industry

MARTIN REISSLEIN

Education

- Ph.D., Systems Engineering, University of Pennsylvania, 1998
- M.S.E., Electrical Engineering, University of Pennsylvania, 1996
- Diplom-Ingenieur (FH), Electrical Engineering, Fachhochschule Dieburg, Germany, 1994

Academic experience

- Arizona State University, Program Chair, Computer Engineering, 2018-present, full time
- Arizona State University, Professor, Electrical Engineering, 2011-present, full time
- Arizona State Univ., Associate Professor, Electrical Engineering, 2005-2011, full time

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- Arizona State Univ., Assistant Professor, Electrical Engineering, 2000-2005, full time

Current membership in professional organizations

- American Society of Engineering Education (ASEE), Member
- Association of Computing Machinery (ACM), Senior Member
- Institute of Electrical and Electronics Engineers (IEEE), Fellow

Honors and awards

- Friedrich Wilhelm Bessel Research Award from Alexander von Humboldt Foundation, 2015
- DRESDEN Senior Fellow, Technical University Dresden, Germany, 2016, 2019
- IEEE Transactions on Education Theodore E. Batchman Best Paper Award, 2016
- Best Paper Award of the IEEE ComSoc Techn. Committee on Communications Systems   Integration and Modeling, 2017
- IEEE Education Society Outstanding Chapter Leadership Award, 2018

Service activities (within and outside of the institution)

- Computer Networks (Elsevier), Associate Editor, 2009-present
- IEEE Access, Associate Editor, 2017-present
- IEEE Commun. Surveys & Tutorials, Area Editor, Optical Communications, 2018-present
- IEEE Transactions on Education, Associate Editor, 2013-present
- IEEE Transactions on Mobile Computing, Associate Editor, 2017-present
- IEEE Transaction on Network and Service Management, Associate Editor, 2021-present
- Optical Switching and Networking (Elsevier), Co-Editor-in-Chief, 2018-present
- Wiley Encyclopedia of Electr. and Electronics Eng., Associate Editor for Networking, 2020-present

Most important publications and presentations from the past five years

- W. Kellerer, P. Kalmbach, A. Blenk, A. Basta, M. Reisslein, and S. Schmid. Adaptable and Data-Driven Softwarized Networks: Review, Opportunities, and Challenges. *Proceedings of the IEEE*, 107(4):711-731, April 2019.
- Z. Xiang, F. Gabriel, E. Urbano, G.T. Nguyen, M. Reisslein, and F.H.P. Fitzek. Reducing Latency in Virtual Machines: Enabling Tactile Internet for Human-Machine Coworking, *IEEE Journal on Selected Areas in Communications*, 37(5):1098-1116, May 2019.
- M. Wang, N. Karakoc, L. Ferrari, P. Shantharama, A. Thyagaturu, M. Reisslein, and Scaglione. A Multi-Layer Multi-Timescale Network Utility Maximization Framework for the SDN-Based LayBack Architecture Enabling Wireless Backhaul Resource Sharing,

  Electronics, 8(9):937.1-937.28, September 2019.
- V. Nguyen, E. Tasdemir, G. T. Nguyen, D. E. Lucani, F. H. P. Fitzek, and M. Reisslein.

  DSEP Fulcrum: Dynamic Sparsity and Expansion Packets for Fulcrum Network Coding,
  IEEE Access, 8:78293-78314, 2020.
- P. Shantharama, A.S. Thyagaturu, A. Yatavelli, P. Lalwaney, M. Reisslein, G. Tkachuk, and E.J. Pullin. Hardware Acceleration for Container Migration on Resource-Constrained

  Platforms, *IEEE Access*, 8:175070-175085, 2020.
- J. Rischke, P. Sossalla, H. Salah, F.H.P. Fitzek, and M. Reisslein. QR-SDN: Towards

  Reinforcement Learning States, Actions, and Rewards for Direct Flow Routing in Software-Defined Networks, *IEEE Access*, 8:174773-174791, 2020.
- N. Karakoc, A. Scaglione, A. Nedic, and M. Reisslein. Multi-Layer Decomposition of Network Utility Maximization Problems, *IEEE/ACM Trans. Netw.*, 28(5):2077-2091, Oct. 2020.
- N. Johnson, B. Turnbull, T. Maher, and M. Reisslein. Semantically Modeling Cyber

  Influence Campaigns (CICs): Ontology Model and Case Studies, IEEE Access, 9:9365 9382, 2020.

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CHRIST D. RICHMOND, PH.D.

1. Education:

   - Doctorate of Philosophy in Electrical Engineering (Ph. D.), MIT 1996
   - Electrical Engineering (E. E.) Degree, MIT 1995
   - Master of Science in Electrical Engineering and Computer Science (S. M.), MIT 1993
   - Bachelor of Science in Electrical Engineering with Honors, University of Maryland College Park 1990
   - Bachelor of Science in Mathematics Summa Cum Laude with Honors, Bowie State University 1990

2. Academic Experience

   - Associate Professor, School of Electrical, Computer and Energy Engineering (ECEE), Arizona State University, Tempe, AZ, July 2017—Present (full-time)
   - Lecturer (in-charge) and Associate of the John A. Paulson School of Engineering and Applied Science, Harvard University, teaching ENG-SCI 250 *Information Theory*, July 2014 – December 2015 (half-time)
   - Lecturer (in-charge) for MIT Graduate Course 6.455J /13.741J / 12.518, *Sonar, Radar, and Seismic Signal Processing I,* MIT Departments of Electrical Engineering & Computer Science, Ocean Engineering, and Earth, Atmospheric, and Planetary Sciences. Fall 2000 (full-time).

3. Non-Academic Experience

   - Senior Staff, Advanced RF Sensors Techniques Group, MIT Lincoln Laboratory, Lexington, MA, August 1996 – June 2017 (full-time). Led research teams as principal investigator on several programs in the development of adaptive algorithms for detection and parameter estimation, performance bounding for active and passive radar/sonar, adaptive communications and passive RF geolocation systems.

4. Professional Organizational Memberships

   - IEEE, *Fellow:*

        IEEE Signal Processing Society, IEEE Information Theory Society,

        IEEE Aerospace & Electronic Systems Society, IEEE Ocean Engineering Society
   - Acoustical Society of America, Full Member
   - Tau Beta Pi, and Golden Key National Honor Society

5. Honors and Awards / Recognition

   - Elevated to IEEE Fellow *for contributions to adaptive array processing algorithms*, January 2020.
   - MIT Lincoln Laboratory Medal for teaching (Technical Education Committee) 2015
   - Promoted to Senior Staff, MIT Lincoln Laboratory, July 2010
   - The IEEE Signal Processing Society 1999 Young Author Best Paper Award, in area of Sensor Array and Multi-channel (SAM) Signal Processing for paper entitled "Derived PDF of Maximum Likelihood Signal Estimator Which Employs an Estimated Noise Covariance," that appeared in the February 1996 Edition of the *IEEE Transactions on Signal Processing*, Vol. 44, No. 2.
   - The Naval Research Lab 1994 Alan Berman Research Publication Award, for paper co-authored with S. Finette, P. Mignerey, and J. Smith entitled "Broadband Source Signature Extraction Using a Vertical Array," that appeared in the July 1993 edition of the *Journal Acoustical Society of America*, Vol. 94 No. 1.
   - Office of Naval Research (ONR) Graduate Fellowship Award, 1990—1994

6. Professional Service

   - IEEE Radar Systems Panel, elected to serve October 2020 for a 3 year term.
   - Guest Editor for special issue on "Radar-Communications Co-Existence for IoT" in the Frontiers in Communications Journal, 2020—2021.
   - Technical Program Committee, IEEE Radar Conference, 21—25 September 2020, Florence, Italy. Serving as Track Chair for Radar Detection and Estimation Theory.
   - Senior Associate Editor for *IEEE Signal Processing Letters*, August 2018—Present

7. Important Publications:

[C1] A. S. Bondre and C. D. Richmond, "Asymptotic Distribution of Generalized Likelihood Ratio Test Under Model Misspecification with Application to Cooperative Radar-Communications," *Proceedings of the ICASSP*, June 6—11, 2021, pp. 8463-8467.

[**Invited Paper**, Special Session: Robust Sensing and Detection in Congested Spectrum]
[J1] A. Coluccia, G. Ricci, and C. D. Richmond, "Adaptive Radar Detection Without Secondary Data for Uncooperative Spectrum Sharing Scenarios," *IEEE Transactions on Signal Processing*, vol. 69, pp. 3206—3219, June 2021.

[J2] C. D. Richmond, "Capon-Bartlett Cross Spectrum and A Perspective on Robust Adaptive Filtering," Special Issue on Robust Multi-Channel Signal Processing and Applications: On the Occasion of the 80th Birthday of Johann F. Bohme, *Signal Processing*, Elsevier, Vol. 171, June 2020.

[M1] S. Fortunati, F. Gini, M. S. Greco, and C. D. Richmond, "Performance Bounds for Parameter Estimation Under Misspecified Models," *IEEE Signal Processing Magazine*, Vol. 34, No. 6, November 2017, pp. 142–157.

8. Professional Development Activity

- Participated in the 2019 NSF Minority Faculty Development Workshop held at Harvard University, Cambridge, MA.

LALITHA SANKAR

Assistant Professor

Arizona State Univeraity, Tempe, AZ 85287.

EDUCATION:

- Ph.D., Electrical Engineering, Rutgers University, 2007
- M.S., Electrical Engineering, University of Maryland, 1992
- B.S., Electrical Engineering, Indian Institute of Technology, Bombay, 1992

ACADEMIC EXPERIENCE:

Arizona State University, Tempe, Arizona

- Assistant Professor, Electrical Computer and Energy Engineering, 2012 – , full time

Princeton University, Princeton, New Jersey

- Research Scholar, Electrical Engineering, 2010-2012, full time
- Science and Technology Postdoctoral Fellow, Electrical Engineering, 2007-2010, full time

Rutgers, The State University of New Jersey, Piscataway, New Jersey

- Graduate Assistant, Electrical and Computer Engineering, 2002-2007

NON-ACADEMIC EXPERIENCE:

AT&T Shannon Labs, Florham Park, New Jersey

- Senior Member of Technical Staff, 1995-2002, full time

Polaroid Corporation, Cambridge, Massachusetts

- Principal Engineer, 1994-1995, full time

PROFESSIONAL MEMBERSHIPS

IEEE Information Theory Society, IEEE Signal Processing Society, IEEE Communications Society, IEEE Power and Energy Systems Society, Tau Beta Pi

HONORS AND AWARDS

- IEEE Information Theory Society Distinguished Lecturer Jan 2020-- Dec 2022
- Lead PI, NSF HDR Institute Grant on Data Science for Electric Grid Monitoring 2019-2021
- NSF CAREER Award 2014
- IEEE Globecom Best Paper Award 2011

SERVICE ACTIVITIES

1. Conference Chair, IEEE SmartGridComm Conference 2020. Phoenix, USA

2. Area Chair NeurIPS 2020 and TPC member IEEE ISIT 2012-2021

3. Invited Workshop speaker: ICML 2021 (Information-theoretic Methods in Learning)

4. 2020-2022: IEEE Information Theory Society Distinguished Lecturer

5. Introduced and developed EEE598: Statistical Machine Learning: From Theory to Practice

6. Graduate Program Chair, PhD program in Data Science, Analytics, and Engineering

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7. Leading the MS in Data Science Program across ASU Engineering in collaboration with FSE Assistant Dean of Graduate Program Office

SELECTED PUBLICATIONS AND PRESENTATIONS IN THE LAST FIVE YEARS:

1. Sypherd Tyler, Diaz Mario, Cava John Kevin, Dasarathy Gautam, Kairouz Peter, Sankar Lalitha. A Tunable Loss Function for Robust Classification: Calibration, Landscape, and Generalization. arXiv preprint arXiv:1906.02314. 2019.

2. Pinceti A, Sankar L, Kosut O. Synthetic time-series load data via conditional generative adversarial networks. Proceedings, IEEE Power and Energy Society General Meeting. Fall 2021.

3. Kairouz P, Liao J, Huang C, Vyas M, Welfert M, Sankar L. Censored and fair universal

representations using generative adversarial models. arxiv.org [Preprint]. 2020 February [revised

2021 April]: [Submitted to the IEEE Trans. Information Forensics and Security].

4. Diaz M, Kairouz P, Liao J, Sankar L. Neural network-based estimation of the MMSE. IEEE

International Symposium on Information Theory. 2021 July.

5. Huang C, Kairouz P, Chen X, Sankar L, Rajagopal R. Context-Aware Generative Adversarial

Privacy. Entropy. 2017 December; 19(12):656. Available from: https://doi.org/10.3390/e19120656

6. Asoodeh S, Liao J, Calmon F, Kosut O, Sankar L. Three variants of differential privacy: Lossless conversion and applications. IEEE Journal on Selected Areas in Information Theory. 2021. DOI: 10.1109/JSAIT.2021.3054692

7. Sypherd T, Diaz M, Sankar L, Dasarathy G. On the α-loss Landscape in the Logistic Model.

2020 IEEE International Symposium on Information Theory (ISIT); 2020 July; Paris, France.

8. Pinceti Andrea, Kosut Oliver, Sankar Lalitha. Data-driven generation of synthetic load datasets preserving spatio-temporal features. 2019 IEEE Power & Energy Society General Meeting (PESGM); Aug. 2019.

9. Diaz Mario, Wang Hao, Calmon Flavio P, Sankar Lalitha. On the robustness of information theoretic privacy measures and mechanisms. IEEE Transactions on Information Theory. 2019;

66(4):1949--1978.

10. Liao J, Kosut O, Sankar L, Calmon F. Tunable Measures for Information Leakage and Applications to Privacy-Utility Tradeoffs. IEEE Transactions on Information Theory. 2019 December; 65(12):8043-8066. DOI: 10.1109/TIT.2019.2935768.

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SARANITI, Marco

POSITION TITLE: Professor of Electrical Engineering

RESEARCH AND PROFESSIONAL EXPERIENCE:

PROFESSIONAL PREPARATION

Institution	Major	Degree	Year
University of Modena, Italy	Physics	B.A.	1991
Technische Universität München, Germany	Physics	PhD	1996
Arizona State University	Computational Physics	PostDoctoral	1996-1998

APPOINTMENTS

Year	Position Title	Institution
2016-present	Vice Dean for Faculty Administration	Arizona State University
2007	Professor	Arizona State University
2004	Associate Professor	Illinois Institute of Technology
2005	Visiting Scientist	Univ. of Illinois Urbana-Champaign
1998	Assistant Professor	Illinois Institute of Technology
1996	Faculty Res. Associate	Arizona State University
1991	Graduate Res. Associate	Technische Universität München, Germany

PUBLICATIONS

Dr. Saraniti is author/co-author of over 65 journal publications, 1 book, 4 book chapters, and several technical reports.

FIVE RELEVANT PUBLICATIONS:

D. Guerra, M. Saraniti, N. Faralli, D. K. Ferry, S. M. Goodnick, and F. A. Marino, "Comparison of N-face and Ga-face GaN HEMTs through Cellular Monte Carlo simulations," IEEE Transactions on Electron Devices, vol. 57, no. 12, pp. 3348–3354, Dec. 2010.

S. M. Goodnick and M. Saraniti, "Modeling and Simulation of Terahertz Devices," invited paper in IEEE Microwave Magazine, 13(7), 36-44 (2012).

F. Sabatti, S. MGoodnick, and M. Saraniti, "Simulation of Phonon Transport in Semiconduc- tors Using a Population-Dependent Many-Body Cellular monte Carlo Approach," Journal of Heat Transfer, 139(3) 032002, Dec. 2016.

R. Soligo, F. Sabatti, S. Chowdhury, and M. Saraniti, "Momentum Space Engineering of GaN HETs for RF Applications Through Full-Band Monte Carlo Simulations," IEEE Transactions on Electron Devices, Vol. 64, no. 11, pp. 4442–4449, Nov. 2017.

K. Merrill, and M. Saraniti, "Nonlinear Electro-Thermal Monte Carlo Device Simulation," Journal of Heat Transfer, 142(2) 022106, Feb. 2020.

FIVE OTHER SIGNIFICANT PUBLICATIONS:

R. Hathwar, M. Saraniti and S. M. Goodnick, "Modeling of Multi-Band Drift in Nanowires using a Full Band Monte Carlo Simulation," *Journal of Applied Physics* **120**, 044307 (2016); DOI: 10.1063/1.4959881.

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F.A. Marino, D. Cullen, D. Smith, M. McCartney, and M. Saraniti, "Simulation of polarization charge on AlGaN/GaN high electron mobility transistors: Comparison to electron holography", Journal of Applied Physics Vol. 107, no. 5, pp. 054516 - 054516-5, March 2010.

R. Akis, N. Faralli, D.K. Ferry, S.M. Goodnick, K.A. Phatak, M. Saraniti, "Ballistic Transport in InP-Based HEMTs," Electron Devices, IEEE Transactions on, vol.56, no.12, pp.2935-2944, Dec. 2009

D. Guerra, M. Saraniti, D. K. Ferry, S. M. Goodnick, and F.A. Marino, "Carrier Dynamics Investigation on Passivation Dielectric Constant and RF Performance of Millimeter-wave Power GaN HEMTs", IEEE Transactions on Electron Devices, vol. 58, no. 11, pp 3876-3884, November 2011.

A. Latorre-Rey, F. Sabatti, J. Albrecht, and M. Saraniti, "Hot Electron Generation Under Large-Signal Radio-frequency Operation of GaN High-Electron-Mobility Transistors," Applied Phyisics Letters 111(1),013506, June 2017.

Graduate Advisees: Shela Wigger (Synopsis) Jinsong Tang , Yibing Hu, Julien Branlard (Deutsches Elektronen-Synchrotron, Hamburg, Germany), Pawel Osuch, Sebastien Beysserie (Apple, CA), David Marreiro (On Electronics), Alex Smolyanitsky (NIST, CO), Nicolas Faralli (Google, CA), Fabio Marino (Qualcomm, CA), Diego Guerra (SpaceX, CA), Flavio Sabatti (Keysight, CA), Riccardo Soligo (Global Communication Semiconductors, CA), Alvaro Latorre-Rey (Intel, OR), Ky Merrill (Arizona State Univ.).

Postdoctoral Advisees: Shela Wigger-Aboud (Synopsis), Julien Branlard (Deutsches Elektronen-Synchrotron, Hamburg, Germany), Nicolas Faralli (Google, CA), Fabio Marino (Qualcomm,CA), Richard Akis, Ky Merrill (Arizona State Univ.).

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JAE-SUN SEO

Education

- Ph.D., Electrical Engineering, University of Michigan, Ann Arbor, 2010
- M.S., Electrical Engineering, University of Michigan, Ann Arbor, 2006
- B.S., Electrical Engineering, Seoul National University, 2001

Academic experience

- Associate Professor (2020–Present), School of ECEE
- Assistant Professor (2014–2020), School of ECEE

Non-academic experience

- Visiting Faculty, Intel Circuits Research Lab, 2015
- Research Staff Member (full time), IBM T. J. Watson Research Center, 2010–2013

Current membership in professional organizations

- IEEE Senior Member
- IEEE Solid-State Circuits Society (SSCS) Member
- IEEE Circuits and Systems Society (CASS) Member
- ACM Member

Honors and awards

- Intel Outstanding Researcher Award, 2021
- Facebook Reality Labs Distinguished Faculty Award, 2020
- National Science Foundation CAREER Award, 2017
- IBM Major Outstanding Technical Achievement Award, 2012

Service activities (within and outside of the institution)

- ASU ARCS (Achievement Rewards for College Scientists) fellowship review committee member, 2018–2019
- ASU School of ECEE faculty search committee member, 2017, 2020
- ASU School of ECEE MSE comprehensive exam coordinator in circuits area, 2017–2018
- Associate Editor for IEEE Open Journal of the Solid-State Circuits Society (OJ-SSCS), 2020–present
- Editorial Review Board (ERB) member for IEEE Solid-State Circuits Letters (SSC-L), 2017–present
- Lead Guest Editor for ACM Journal on Emerging Technologies in Computing Systems (JETC): Special Issue on "Hardware and Algorithms for Energy-Constrained On-chip Machine Learning" (May 2019 (Part 1), December 2019 (Part 2))
- Co-Guest Editor for ACM Journal on Emerging Technologies in Computing Systems (JETC): Special Issue on "Frontiers of Hardware and Algorithms for On-chip Learning" (July 2018)

Important publications and presentations from the past five years

- Shihui Yin, Bo Zhang, Minkyu Kim, Jyotishman Saikia, Soonwan Kwon, Sungmeen Myung, Hyunsoo Kim, Sang Joon Kim, Mingoo Seok, and Jae-sun Seo, "PIMCA: A 3.4-Mb Programmable In-Memory Computing Accelerator in 28nm for On-Chip DNN Inference," *IEEE Symposium on VLSI Circuits*, June 2021
- Minkyu Kim and Jae-sun Seo, "Energy-Efficient Deep Convolutional Neural Network Accelerator Featuring Conditional Computing and Low External Memory Access," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 56, no. 3, pp. 803-813, March 2021.
- Sai Kiran Cherupally, Shihui Yin, Deepak Kadetotad, Chisung Bae, Sang Joon Kim, and Jae-sun Seo, "A Smart Hardware Security Engine Combining Entropy Sources of ECG, HRV and SRAM PUF for Authentication and Secret Key Generation," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 55, no. 10, pp. 3680-3690, October 2020. [Invited for Special Issue on 2019 ASSCC]
- Wangxin He, Shihui Yin, Yulhwa Kim, Xiaoyu Sun, Jae-Joon Kim, Shimeng Yu, and Jae-sun Seo, "2-Bit-per-Cell RRAM based In-Memory Computing for Area-/Energy-Efficient Deep Learning," *IEEE Solid-State Circuits Letter (SSC-L)*, vol. 3, pp. 194-197, July 2020. [Special Section on 2020 ESSCIRC]
- Zhewei Jiang, Shihui Yin, Jae-sun Seo, and Mingoo Seok, "C3SRAM: An In-Memory-Computing SRAM Macro Based on Robust Capacitive Coupling Computing Mechanism," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 55, no. 7, pp. 1888-1897, July 2020. [Invited for Special Issue on 2019 ESSCIRC]

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- Deepak Kadetotad, Shihui Yin, Visar Berisha, Chaitali Chakrabarti, and Jae-sun Seo, "An 8.93 TOPS/W LSTM Recurrent Neural Network Accelerator Featuring Hierarchical Coarse-Grain Sparsity for On-Device Speech Recognition," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 55, no. 7, pp. 1877-1887, July 2020. [Invited for Special Issue on 2019 ESSCIRC]
- Shihui Yin, Zhewei Jiang, Jae-sun Seo, and Mingoo Seok, "XNOR–SRAM: In-Memory Computing SRAM Macro for Binary/Ternary Deep Neural Networks," *IEEE Journal of Solid-State Circuits (JSSC)*, vol. 55, no. 6, pp. 1733-1743, June 2020.

Briefly list the most recent professional development activities

- "Introduction Into In-Memory Computing and Efficient AI Processing at the Edge" Presentation as part of the Educational Workshop "Edge AI and In-Memory-Computing for energy efficient AIoT solutions" at 2020 European Solid-State Circuits Conference
- "Monolithically Integrated RRAM-based Analog/ Mixed-Signal In-Memory Computing for Energy-Efficient Deep Learning" Presentation as part of the Workshop "Analog Computing Technologies and Circuits for Efficient Machine Learning Hardware" at 2020 Symposia on VLSI Technology and Circuits
- "Structured Sparsity and Low-Precision Quantization for Energy-/Area-Efficient DNNs" Presentation as part of the Forum "ML at the Extreme Edge: Machine Learning as the Killer IoT App" at 2020 IEEE International Solid-State Circuits Conference (ISSCC
- "The Role of NVM, Emerging Memories and In-Memory Compute for Edge AI" Panel at 2020 TinyML Summit
- "Early Career Workshop" Panel at 2018 ACM/IEEE Design Automation Conference (DAC)

BRIAN J. SKROMME, PROFESSOR

EDUCATION

- Ph.D., Electrical Engineering, University of Illinois at Urbana-Champaign, 1985
- M.S., Electrical Engineering, University of Wisconsin-Madison, 1980
- B.S. (with high honors), Electrical Engineering, University of Wisconsin-Madison, 1978

ASU ACADEMIC EXPERIENCE

- 2011-2019 Assistant Dean, Fulton Schools of Engineering, Arizona State University, 50% time
- 2006-present   Professor, Arizona State University, full time
- 1989-2006   Associate Professor, Arizona State University, full time

NON-ACADEMIC EXPERIENCE

- 9/07-5/08   Device Development Engineer (sabbatical leave), Freescale Semiconductor, Tempe, AZ, full time
- 9/98-5/99   Visiting Researcher in SiC and GaN device group of Syd Wilson,
  & 5/00-8/00   Materials Technology Laboratories, Motorola SPS, Tempe, AZ, full time
- 1985-1989   Member of Technical Staff, Bellcore, Red Bank, NJ, full time
- 1978-1985   Research Assistant, University of Illinois at Urbana-Champaign, 50% time

CURRENT MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

- IEEE Senior Member
- Eta Kappa Nu
- American Society for Engineering Education

HONORS AND AWARDS

- Top 5% Teaching Award, Fulton Schools of Engineering
- Golden Key National Honor Society Outstanding Professor Award

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- Eta Kappa Nu Young Faculty Teaching Award
- Best published student paper, 1984 Electronic Materials Conference
- Best oral student paper, 1982 Electronic Materials Conference

SERVICE ACTIVITIES

University (including college and department levels)

- University Graduate Council, 2014-17
- ASU General Studies Council, 2013-16 (including Chair, CS/MA Subcommittee)
- University Academic Integrity Committee 2017-2019

Professional

- Program Committee, 2013-2015, 2017 Frontiers in Education Conferences
- Served as volunteer moderator, Arizona Middle School Science Bowl (2014-2021)
- Member, Board of Directors, Arizona Nanotechnology Cluster (2013-present)
- Panelist for National Science Foundation; reviewer for various journals and conference publications

PRINCIPAL PUBLICATIONS (selected from 2015-2020)

1. "Step-based tutoring software for complex procedures in circuit analysis," B. J. Skromme, S. K. Bansal, W. M. Barnard, and M. A. O'Donnell, in Proceedings of the 2019 IEEE Frontiers in Education Conference (Inst. Electrical & Electronics Engrs., Piscataway, NJ, 2019), Covington, KY, USA, 2019, pp. 1-5, doi: 10.1109/FIE43999.2019.9028520, https://ieeexplore.ieee.org/document/9028520

2. "Turning mesh analysis inside out," B. J. Skromme, W. M. Barnard, and M. White, in Proceedings of the 2020 American Society for Engineering Education Annual Conference & Exposition (Amer. Soc. Engrg. Educat., Washington, D.C., 2020), p. 35403-1-35403-12, https://peer.asee.org/35403.

3. "Interactive editing of circuits in a step-based tutoring system," B. J. Skromme, C. Redshaw, A. Gupta, S. Gupta, P. Andrei, H. Erives, M. White, D. Bailey, W. L. Thompson II, S. K. Bansal, and W. M. Barnard, in Proceedings of the 2020 American Society for Engineering Education Annual Conference & Exposition (Amer. Soc. Engrg. Educat., Washington, D.C., 2020), p. 34859-1-34859-16, https://peer.asee.org/34859.

4. "Impact of step-based tutoring on student learning in linear circuit courses," B. J. Skromme, V. Seetharam, X. Gao, B. Korrapati, B. E. McNamara, Y.-F. Huang, and D. H. Robinson, in the Proceedings of the 2016 IEEE Frontiers in Education Conference (Inst. Electrical & Electronics Engrs., Piscataway, NJ, 2016), pp. 1-9, http://ieeexplore.ieee.org/document/7757638/.

5. "Interactive tutorial system for linear circuit analysis: Impact on learning and novel tutorials," B. J. Skromme, B. E. McNamara, X. Gao, B. Korrapati, V. Seetharam, Y.-F. Huang, and D. H. Robinson, in Proceedings of the 2016 American Society for Engineering Education Annual Conference & Exposition (Amer. Soc. Engrg. Educat., Washington, D.C., 2016), p. 25439-1-25439-16, https://peer.asee.org/25439.

6. "Impact of a step-based tutoring system on student learning and motivation," B. J. Skromme, P. J. Rayes, B. E. McNamara, V. Seetharam, X. Gao, T. Thompson, X. Wang, B. Korrapati, B. Cheng, Y.-F. Huang, D. H. Robinson, Y. Astatke, J. Ross, and A. L. Holmes, presentation at the Symposium on Envisioning the Future of Undergraduate STEM Education: Research and Practice, Washington, 2016.

7. "Step-based tutoring system for introductory linear circuit analysis," B. J. Skromme, P. J. Rayes, B. E. McNamara, V. Seetharam, X. Gao, T. Thompson, X. Wang, B. Cheng, Y.-F. Huang, and D. H. Robinson, in the Proceedings of the 2015 IEEE Frontiers in Education Conference (Inst. Electrical & Electronics Engrs., Piscataway, NJ, 2015), pp. 1752-60. http://fie2015.org/sites/fie2015.fie-conference.org/files/FIE-2015_Proceedings_v11.pdf

8. "Addressing barriers to learning in linear circuit analysis," B. J. Skromme and D. H. Robinson, in the Proceedings of the 2015 American Society for Engineering Education Annual Conference & Exposition (Amer. Soc. Engrg. Educat., Washington, D.C., 2015), pp. 14125-1–14125-15. http://www.asee.org/public/conferences/56/papers/14125/view

PROFESSIONAL DEVELOPMENT ACTIVITIES

[Type here]

- Attended Annual Meeting of the American Society of Engineering Educators and presented papers, 2015-2018, 2020.
- Attended Frontiers of Education Conference and presented papers, 2015, 2016, 2019

ANDREAS SAVVA SPANIAS, PROFESSOR AND CENTER DIRECTOR

School of Electrical, Computer and Energy Engineering, ASU

Education

- Ph.D. 1988, Dept. of Electrical and Computer Eng., WVU.
- M.S. 1985, Dept. of Electrical and Computer Eng., WVU.
- B.S.E.E. 1983, Dept. of Electrical and Computer Eng., WVU.
- HTI Diploma, Nicosia Cyprus, 1979

Academic Experience

- Aug. 2009-present, Director SenSIP Center and NSF I/UCRC Industry Consortium, ASU.
- Aug. 2014-present, Senior Sustainability Scientist, Global Inst. of Sustainability, ASU.
- Aug. 2003-2011, Founding Associate Director of School of Arts, Media and Engineering, ASU.
- Aug. 1997-present, Professor, School of Electrical, Computer and Energy Engineering, ASU.
- Aug. 1993-July 1997 Associate Professor, Department of Electrical Engineering, ASU.
- Aug. 1988-July 1993 Assistant Professor, Department of Electrical Engineering, ASU.
- Aug 1983-Aug. 1988 Graduate Research Assistant, Funded by Naval Research Labs, ECE, WVU.

Memberships

- 2019 Elected Senior Member of the National Academy of Inventors (NAI), August 2019
- 2019 National Academy of Inventors (NAI) ASU Chapter, April 2019.
- IEEE Fellow (elected in 2003 for contributions in speech processing).

Honors and Awards

- 2019, 2020 Top 5% faculty in teaching award recipient, IAFSE Schools of Engineering, ASU, 2020.
- 2018 IEEE Region 6 Award "For Outstanding Research & Education Contributions in SP."
- 2018 IEEE Phoenix Chapter Award "For significant innovations and patents"
- 2015 Harden-Simmons Prize Paper Award on Power Amplifier Linearization Techniques.
- 2012 Premier Award for iJDSP iPhone software (Plenary 500 attendees, IEEE FIE Seattle)
- 2004 IEEE Distinguished Lecturer in signal processing (7 international invited seminars in 2004).
- 2005 IEEE Signal Processing Soc. Award for Meritorious Service
- 2002 IEEE Donald G. Fink Prize Paper "Perceptual Coding of Digital Audio."
- 1993 Award Intel for " Contributions in the Development of the Intel 60172 SP Architecture."

Service Activities

- Associate Editor, IEEE Signal Processing Letters, 2000-2002.
- Vice-President Conferences, IEEE Signal Processing Society, 2000-2002.
- Member Board of Governors, IEEE Signal Processing Society, 2004-2007.
- General Conference Co-Chair, (with Dr. Cochran) IEEE ICASSP-1999
- Lecture Series Editor, Synthesis Lectures on Algorithms, Morgan & Claypool Publ., 2006-present.
- ECEE Systems Area Committee, Member 1988-present, Chair 1998-2016, Member.
- ECEE Graduate Committee, Chair 1996-97, Chair 2000-2008.
- ECEE Personnel Committee, member, 1999-2000, 2004-2015, 2018-2020)
- IAFSE Deans Executive Committee, 2016-present.

Publications

Books

- Andreas Spanias, Ted Painter, Venkatraman Atti, Audio Signal Processing and Coding, Hardcover 544 pages, ISBN: 9780471791478, Wiley, Textbook with theory, March 2007.

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- A. Spanias, Digital Signal Processing; An Interactive Approach – **2nd Edition**, 403 pages, Textbook with JAVA exercises, ISBN 978-1-4675-9892-7,Lulu Press On-demand Publishers Morrisville, May 2014.

Journal Papers

- Muniraju, G. Kailkhura, J. Thiagarajan, Jayaraman J.; Bremer, Peer-Timo; Tepedelenlioglu, Cihan; Spanias, Andreas, "Coverage-Based Designs Improve Sample Mining and Hyper-Parameter Optimization" *IEEE Trans. NNLS-2019-P-11125.R1*, 2020.
- Muniraju, C. Tepedelenlioglu, and A. Spanias, "Analysis and design of robust max consensus for wireless sensor networks," *IEEE Transactions on Signal and Information Processing over Networks*, pp. 779-791, V. 5, Dec. 2019.
- Muniraju, C. Tepedelenlioglu, and A. Spanias, "Consensus Based Distributed Spectral Radius Estimation," in *Proceeding of IEEE Signal Processing Letters*, pp. 1–5, June 2020.
- Uday Shankar Shanthamallu, Jayaraman J. Thiagarajan, Huan Song, Andreas Spanias, "GrAMME: Semi-Supervised Learning using Multi-layered Graph Attention Models," *IEEE Transactions on Neural Networks and Learning Systems,* pp. 1-12, Nov. 2019.
- Zuniga-Mejia1, R. Villalpando-Hernandez, C. Vargas-Rosales1, A. Spanias, "A Linear Systems Perspective on Intrusion Detection for Routing in Reconfigurable Wireless Networks", *IEEE Access,* Vol. 7, 1, pp. 60486-60500, Dec. 2019.
- V. Berisha, A. Wisler, A. Hero, A. Spanias, "Data-driven estimation of density functionals using a polynomial basis" *IEEE Transactions on Signal Processing*, pp. 558-572, Vol. 66, January 2018.
- S. Zhang, C. Tepedelenlioğlu, A. Spanias, "Distributed Network Center and Size Estimation," *IEEE Sensors Journal*, Volume: 18 , Issue: 14, pp. 6033 - 6045, 2018.
- S. Zhang, C. Tepedelenlioglu, M.K. Banavar and A. Spanias, "Max Consensus in Sensor Networks: Non-linear Bounded Transmission and Additive Noise," *IEEE Sensors Journal*, V.16, pp. 9089-9098, Dec. 2016.

Professional Development

- MIT Certificate on "Leadership Skills for Engineering and Science Faculty," Massachusetts Institute of Technology, Short Programs, June 2017.
- Harvard University, "Data Visualization: Conveying Information through Visual Representations," Harvard Continuing Education, Cambridge, June 2018.

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CIHAN TEPEDELENLIOGLU

Education

B.S.	Electrical Engineering	Florida Institute of Technology	1995
M.S.	Electrical Engineering	University of Virginia	1998
PhD.	Electrical and Computer Engineering	University of Minnesota	2001

Academic experience

Arizona State University   Associate Professor (Electrical Engineering) Aug. 2007 – Present

Arizona State University   Assistant Professor (Electrical Engineering) Jun. 2001 – Aug. 2007

Current membership in professional organizations

Senior Member, IEEE

Honors and awards

Early Career Award from NSF, 2002-2007;

Outstanding Teaching Award, IEEE Phoenix Section, 2003;

Service activities (within and outside of the institution)

Advisor to the Student Branch of IEEE at ASU, 2003-present.

Chair of the Commun. and Signal Proc. Section of the Phoenix Chapter of IEEE 2003-2005.

Associate Editor for IEEE Transactions on Wireless Communications (2013-2017), IEEE Transactions on Communications (2006-2013), IEEE Transactions on Vehicular Technology (2003-2005), IEEE Signal Processing Letters (2004-2006). Former Editorial Board Member for IEEE Communication Surveys and Tutorials (2007). Guest Editor for EURASIP Journal on Advances in Signal Processing for the special issue on Advanced Equalization Techniques for Wireless Communications (2010).

Member of the TPC of many IEEE conferences including SPAWC 2012, ISCAS 2002 and ICC 2003-2007; GLOBECOM 2004-2009, ICASSP 2003-2019; Tutorial on OFDM Systems at ISCAS 2002.

Technical Program Co-chair, SENSIP Workshop, Sedona, AZ 2008.

Reviewer for IEEE Transactions on Signal Processing, IEEE Transactions on Information Theory, IEEE Transactions on Communications, IEEE Transactions on Vehicular Technology, IEEE Transactions on Wireless Communications, IEEE Communication Surveys and Tutorials, IEEE Signal Processing Letters, IEE Proceedings on Communications, Signal Processing,

Finance Chair for CAMSAP, 2017.

Finance Chair for IEEE Communication Theory Workshop, 2007.

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Important Publications from the past 5 years

H. Senol, C. Tepedelenlioglu, "Subspace-based Estimation of Rapidly Varying Mobile Channels for OFDM Systems", IEEE Transactions on Signal Processing, vol. 69, pp. 385-400.

J. Fan, C. Tepedelenlioglu, A. Spanias, "Graph-Based Classification with Multiple Graph Shift Matrices", IEEE Transactions on Signal and Information Processing over Networks, (to appear).

A. Ewaisha, C. Tepedelenlioglu, "Offloading Deadline-Constrained Cellular Traffic" IEEE Trans. on Wireless Commun., (submitted).

H. Braun, S. Katoch, P. Turaga, A. Spanias, C. Tepedelenlioglu, "A MACH Filter-Based Reconstruction-Free Target Detector and Tracker for Compressive Sensing Cameras" International Journal of Smart Security Technologies vol. 7, no. 2, 2020 (21 pages).

J. Lee, C. Tepedelenlioglu, A. Spanias, G. Muniraju, "Distributed quantiles estimation of sensor network measurements", International Journal of Smart Security Technologies vol. 7, no. 2, pp. 38-61, 2020.

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TREVOR J. THORNTON

Education

- BS, Physics and Theoretical Physics, Cambridge University, Cambridgeshire, UK, 1983
- PhD, Physics and Theoretical Physics, Cambridge University, Cambridgeshire, UK, 1987

Academic experience

- Cambridge University, Cambridge, Cambridgeshire, UK, Junior Fellow of Corpus Christi College, 1986 – 1988, full time
- Imperial College London, UK, Lecturer, Electrical Engineering, 1990 – 1996, full time
- Imperial College London, UK, Reader, Electrical Engineering, 1996 – 1998, full time
- Arizona State University, Tempe, AZ Professor of Electrical Engineering, 1998 – Present, full time

Non-academic experience

- Bell Communications Research (Bellcore), Red Bank, NJ, Member of Technical Staff, 1988 – 1989, full time

Current membership in professional organizations

- Senior Member, IEEE

Honors and awards

- 2015 Tatsuo Itoh best paper award from the IEEE Microwave Theory and Techniques Society for the Microwave and Wireless Components Letters paper entitled "32 dBm Power Amplifier on 45nm SOI CMOS" vol. 23, pp. 161-163, March 2013.
- 2009 IMAPS Best Student Paper Award for N. Summers, W. Lepkowski, S. Wilk, and T. J. Thornton, "250C Voltage Compliant SOI MESFET's for High Power PWM Drive Circuits," presented at High Temperature Electronics Network (HiTEN), Oxford, UK 13-16 September, (2009).

Service activities

- ECEE Personnel Committee, Chair
- ASU NanoFab Governance Board, Member
- Secretary of the Waves and Devices Chapter of the IEEE Phoenix Section (http://ewh.ieee.org/r6/phoenix/wad/)

Publications

- V. Jha, H. Surdi, M. F. Ahmad, F. Koeck, R. J. Nemanich, S. Goodnick and T. J. Thornton

  "Diamond Schottky p-i-n Diodes for High Power RF Receiver Protectors"

  Solid State Electronics, in preparation, 2021
- H. Surdi, M. F. Ahmad, F. Koeck, R. J. Nemanich, S. Goodnick and T. J. Thornton

  "RF Characterization of Diamond Schottky pin Diodes for Receiver Protector Applications."

  IEEE Microwave and Wireless Components Letters 30.12 (2020): 1141-1144.
- X. Zhang, P. Mehr, and T. J. Thornton,

  "Self-Heating in 40 nm SOI MOSFETs on High Resistivity, Trap- Rich Substrates".

  IEEE Transactions on Nanotechnology, vol. 19, pp. 42-46, 2020.
- P. Mehr, S. Moallemi, X. Zhang, W. Lepkowski, J. Kitchen, and T. J. Thornton,

  "CMOS-Compatible MESFETs for High Power RF Integrated Circuits"

  IEEE Transactions on Semiconductor Manufacturing, vol. 32(1). pp. 14-22, 2019.
- S. Moallemi, P. Mehr, K. Grout, T. J. Thornton and J. Kitchen,

  "Adaptive Power Control Using Current Adjustment for Watt-Level Power Amplifiers in CMOS SOI," IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 67, no. 4, pp. 605-609, April 2020, doi: 10.1109/TCSII.2019.2915058.
- P. H. Mehr, W. Lepkowski, and T. J. Thornton

  "K-Band CMOS-Based MESFET Cascode Amplifiers"

  IEEE Microwave and Wireless Components Letts, vol. 28, pp. 609 – 611, July 2018
- P. H. Mehr, S. Moallemi, X. Zhang, W. Lepkowski, J. Kitchen, and T. J. Thornton

  "CMOS-Compatible MESFETs for High Power RF Integrated Circuits"

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IEEE Trans. Semiconductor Manufacturing, vol. 31 pp. 1 – 8, August 2018

- P. H. Mehr, W. Lepkowski, X. Zhang, S. Moallemi, J. Kitchen and T. J. Thornton,
  "Enhanced voltage silicon NFET-MESFET cascode amplifiers integrated on a 45nm SOI CMOS technology for RFIC applications"
  28th Annual SEMI Advanced Semiconductor Manufacturing Conference (ASMC), Saratoga Springs, NY, USA, 2017, pp. 342-345. doi: 10.1109/ASMC.2017.796925
- T. J. Thornton , W. Lepkowski, and S. J. Wilk
  "Impact Ionization in SOI MESFETs at the 32-nm Node",
  IEEE Transactions on Electron Devices vol. 63, pp.4143 - 4146, August 2016
- M. Pepper and T. J. Thornton and D. A. Wharam
  "Early work on semiconductor quantum nanoelectronics in the Cavendish Laboratory"
  Journal of Physics: Condensed Matter, vol. 28, pp. 421003 - 421007, August 2016
- R. Tsui, R. Ehrmann, R. Furlan, and T.J. Thornton
  "Surveying the Sustainability of Nanotechnology Workforce Education Programs in the United States"
  Journal of Nanoeducation, vol. 8, pp. 12 – 21, June 2016

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GEORGIOS TRICHOPOULOS

Education

PhD in Electrical and Computer Engineering, The Ohio State University (2013)

Academic experience:

Assistant Professor – Arizona State University, ECEE   2015- present

Senior Researcher - The Ohio State University, ECE   2014 - 2015

Postdoctoral Researcher - The Ohio State University, ECE   2013 – 2014

Non-academic experience:

TeraProbes Inc, Chief Technology Officer, 2014- present

Current membership in professional organizations

Institute of Electrical and Electronic Engineers (IEEE)

IEEE Antennas and Propagation Society

IEEE Microwave Theory and Techniques Society

URSI Member

Honors and awards

National Science Foundation CAREER Award 2019

IEEE International Microwave Symposium Three-minute Thesis Competition – 3rd Place and Audience Choice Award (2018). (PhD Student Theofanopoulos)

IEEE Antennas and Propagation Symposium Student Paper Competition - Honorable Mention (2018). (PhD Student Theofanopoulos)

IEEE Antennas and Propagation Symposium Student Paper Competition - Finalist (2014). (Caglayan, Trichopoulos, Sertel)

OSU ElectroScience Laboratory Best Paper Award (2014). (Caglayan, Trichopoulos, Sertel)

Inspiration Award - ElectronicProducts.com (technology portal) (2014) – (Trichopoulos, Sertel)

1st place in IEEE Antennas and Propagation Symposium Student Paper Competition (2013). (Trichopoulos, Sertel)

Service activities

Book Review Editor (Radio Science Bulletin, URSI) (2015- present)

International/national conferences committees

1. 12th International Workshop on Low Temperature Electronics 18–21 September 2016, Tempe, AZ, USA.

2. Engineered Micro Systems and Devices Workshop, International Microelectronics Assembly and Packaging Society (2018 and 2019, Local Organizing Committee).

3. 31ST IEEE International Symposium on Space Terahertz Technology (2020, Local Organizing Committee)

International/national conferences sessions organized

Special Session on "Terahertz Antennas and Applications", 2017 USNC-URSI National Radio Science Meeting, January 4-7, 2017, Boulder, CO.

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University Services and Facilities Committee – NanoFab Core Facility Governance Board (Board Member, Elected, 2020- present)

Important publications and presentations from the past five years

- G. Kashyap, P. C. Theofanopoulos, Y. Cui and G. C. Trichopoulos, "Mitigating Quantization Lobes in mmWave Low-Bit Reconfigurable Reflective Surfaces," in IEEE Open Journal of Antennas and Propagation, vol. 1, pp. 604-614, 2020
- P. C. Theofanopoulos, M. Sakr and G. C. Trichopoulos, "Multistatic Terahertz Imaging Using the Radon Transform," in IEEE Transactions on Antennas and Propagation, vol. 67, no. 4, pp. 2700-2709, April 2019.
- M. Aladsani, A. Alkhateeb and G. C. Trichopoulos, "Leveraging mmWave Imaging and Communications for Simultaneous Localization and Mapping," ICASSP 2019 - 2019 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2019, pp. 4539-4543.
- Y. Cui and G. C. Trichopoulos, "A Quasi-Optical Testbed for Wideband THz On-Wafer Measurements," in IEEE Transactions on Terahertz Science and Technology, vol. 9, no. 2, pp. 126-135, March 2019.
- T. S. Rappaport et al., "Wireless Communications and Applications Above 100 GHz: Opportunities and Challenges for 6G and Beyond," in IEEE Access, vol. 7, pp. 78729-78757, 2019.

Briefly list the most recent professional development activities

- Co-founded (with Prof. Imani) the Applied Electromagnetics Colloquium @ ASU (2021)
- (3 invited talks as of May 15, 2021)
- New Faculty Advisory Council (2016-2018) – Chair of the subcommittee for junior faculty mentoring.
- Volunteer in ASU's E2 Camp (2016, 2017)
- Mentored the Phoenix 3U Cubesat Team– Antenna Design and Communications Team
- Mentored 1 high school student in the summer 2018
- Mentored 2 undergraduate students in research projects (FURI Award)
- Mentored 7 graduate MS students in research projects (MORE Award)

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KONSTANTINOS S. TSAKALIS

Professor, ECEE Undergraduate Program Chair

EDUCATION

- Ph.D., Electrical Engineering, University of Southern California, Aug. 1988.
- M.S., Electrical Engineering, University of Southern California, Dec. 1985.
- M.S., Chemical Engineering, University of Southern California, May 1984.
- Professional Diploma (B.Sc.), Chemical Engineering, NTUA, Greece, June 1983.

FACULTY APPOINTMENTS

- 2016-present: Undergraduate Program Chair, ECEE, Arizona State University.
- 2003-present: Professor, Department of Electrical Engineering, Arizona State University.
- 1994-2003: Associate Professor, Dept. of Electrical Engineering, Arizona State University.
- 1988-1994: Assistant Professor, Dept. of Electrical Engineering, Arizona State University.

RELATED NON-ACADEMIC EXPERIENCE

- InControl Engineering LLC, 2008 - present, Founder and Managing Partner
- Aug.-Dec. 2004: Visiting Professor, Department of Physics, University of Athens, Greece.
- May-Jun. 1998: Visiting Professor, Department of Physics, University of Athens, Greece.
- Consulting Experience And Patents, 1998-Present: Consulting with Semy Engineering, Semitool, Brooks Automation, Applied Materials, Honeywell, EPRI on applications of control, optimization, and system identification.

SOCIETY MEMBERSHIPS

   IEEE (1987-), Sigma Xi (1987-2019) Licensed Chemical Engineer with the Technical Chamber of Greece.
   Lexington Who's Who (1999-), Marquis Who's Who (2006-).

HONORS AND AWARDS

- GreyDyne LLC (with A. Shafique): Dec 2018 - won the Skysong ASU Researcher Accelerator startup competition, Apr 2018 – won the Allstate Venture Challenge.
- Paper Award: L.B. Good, S. Sabesan, S.T. Marsh, K. Tsakalis, L.D. Iasemidis & D.M. Treiman, "Automatic seizure prediction and deep brain stimulation control in epileptic rats", Philadelphia, Pennsylvania, American Epilepsy Society Annual meeting, 2007.
- Co-developer of the embedded controller SEMY's MBTC, (U.S. Patent No. 5,895,596) that received an "Editor's Choice Best Product Award" for 1998, by Semiconductor International (installed in more than 400 production furnaces world-wide).

INSTITUTIONAL AND PROFESSIONAL SERVICE (2015-2021)

- Associate Editor, IMA Journal on Mathematical Control and Information (2013-)
- Student Programs Chair for 2017 American Control Conference
- Member of the IFAC Technical Committee ``Adaptive and Learning Systems'' (2015-2017)
- Member of the Program Committee for the ``Industrial Controls'' track of ETFA 2015 Conf.
- International Program Committee for the IASTED conferences MIC 2006--2016.
- University Committee Service: Faculty Senate (2006-), Research and Creative Activities Committee (University, 2008-2010, 2014-), High-Performance Computing Committee (University, 2014-), Standards Committee (College, 2000-), Undergraduate Committee, (2005-2016), Personnel Committee, EE Dept. (2003-)

PUBLICATIONS (SUMMARY: 1 book, 14 bk chapt., 55 journl, 127 conf. articles, 13 US patents.

[1] Shuang, Fei and Deng, Haokun and Shafique, Ashfaque B and Marsh, Steve and Treiman, David and Tsakalis, Kostas and Aifantis, Katerina E, ``A first study on nanoporous tungsten recording electrodes for deep brain stimulation,'' Materials Letters, V.260 p.126885, 2020, North-Holland

[2] Joshi, R., V. Serrano, K. Tsakalis, "PID-MMAC using an approximate H-inf loop-shaping metric IFAC PapersOnLine, 51-4, (2018), 479-484. Presented at the 3rd IFAC Conference on Advances in Proportional-Integral-Derivative Control (PID 2018), Ghent, Belgium, May 9-11, 2018.

[3] Shafique A., Sayeed M., Tsakalis K. (2018) Nonlinear Dynamical Systems with Chaos and Big Data: A Case Study of Epileptic Seizure Prediction and Control. In: Srinivasan S. (eds) Guide to Big Data Applications. Studies in Big Data. vol 26, pp. 329-369, Springer, Cham

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[4] A.B. Shafique, R. Joshi and K. Tsakalis, "Control relevant system identification using multiple short data sets," 2017 IEEE Conference on Control Technology and Applications (CCTA), Mauna Lani, HI, 2017, pp. 1728-1733.

[5] I. Vlachos, B. Krishnan, D. M. Treiman, K. Tsakalis, D. Kugiumtzis and L. D. Iasemidis, "The Concept of Effective Inflow: Application to Interictal Localization of the Epileptogenic Focus From iEEG," in IEEE Transactions on Biomedical Engineering, vol. 64, no. 9, pp. 2241-2252, Sept. 2017.

[6] Ashfaque B. Shafique, Darpan Saha, Steven T. Marsh, David M. Treiman, and Konstantinos Tsakalis, "A New Method for Seizure Detection using a Modified Kantz Algorithm for Lyapunov Exponent Estimation," American Epilepsy Society Annual Meeting Abstracts: (Abst. 2.141), 2017 December 1-5, Washington DC, (1p)

[7] R. Joshi, K. Tsakalis, J.W. MacArthur, S. Dash, ``Account for Uncertainty with Robust Control Design: Parts 1 and 2,'' Chemical Engineering Progress, 31-38, Nov. 2014, 46-50, Dec. 2014.

[8] Steenis, J. ; Tsakalis, K. ; Ayyanar, R., ``An Approach to Bumpless Control for LPV Modeled Inverters in a Microgrid'' IEEE Transactions on Power Electronics, V.29, 11, 6214-6223, 2014.

RECENT PROFESSIONAL DEVELOPMENT:

- Invited Keynote Speaker, "Industrial Smart Sensor Trends," INTEL 2019 Software Professionals Conference, Oct. 23, 2019, Chandler, AZ. (audience ~100)
- K. Tsakalis (PI) I-Corps: Epileptic Seizure Detection System National Science Foundation, Award#1747974, 10/1/2017 – 3/31/2019.
- Start-up company GreyDyne (with Shafique): Dec 2018 - Won the Sksyong ASU Researcher Accelerator startup competition ($25,000). Apr 2018 - Demo Day at ASU. Won the Allstate Venture Challenge $2,500
- Student Programs Chair for 2017 American Control Conference

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DRAGICA VASILESKA

Professor

Education

      Ph.D. Electrical Engineering, Arizona State University (1995)

      M.S. Electrical Engineering, Ss Cyril and Methodius (1992)

      BS (Diploma), Electrical Engineering, Ss Cyril and Methodius (1985)

Academic experience

- Professor Arizona State University Department of Electrical, Computer and Energy Engineering, Tempe, Arizona United States (2007 - Ongoing)
- Visiting Professor Universidade Federal do Rio Grande do Sul School of Electrical Engineering (2014 - 2014)
- Visiting Professor Purdue University, West Lafayette, Indiana United States (2006 - 2013)
- Institute for Microelectronics, Technical University of Vienna, Vienna Austria (2012 - 2012)
- Associate Professor Arizona State University, Tempe, Arizona United States (2003 - 2007)
- Purdue University, West Lafayette, Indiana United States (2005 - 2006)
- Assistant Professor Arizona State University, Tempe, Arizona United States (1997 - 2003)
- Faculty Research Associate Arizona State University, Tempe, Arizona United States (1995 - 1997)
- Graduate Research Associate Arizona State University, Tempe, Arizona United States (1991 - 1995)
- Lecturer University Sts. Cyril and Methodius College of Electrical Engineering, Skopje Republic of Macedonia (1986 - 1990)

Current membership in professional organizations

- IEEE Fellow ('F2019)

Honors and awards

- NSF, CAREER 1998
- Fulbright Specialist program (2011 - 2012)

Service activities (within and outside of the institution)

- MSE Examination Committee (Solid State Area), (School of Electrical, Computer and Energy Engineering)
- Undergraduate Committee, (School of Electrical, Computer and Energy Engineering)
- Served as a Fulbright Mentor/Application Reviewer for year 2019, (School of Electrical, Computer and Energy Engineering), 2019
- IWCN, Committee Title: International Advisory and Program Committee, Role or Position: Member, 2012-Present
- Journal of Computational Electronics: Editorial Board Member.
- International Workshop for Computational Nanotechnology (IWCN): Organizing and Program Committee member for IWCN 2019.
- On the Technical Committee of the 2017 International Electron Device Meeting (IEDM), December 2-7, 2017, San Francisco, CA.
- Organizing Committee Member of the 2017 IWCN Conference.
- Session Chair, IEEE IEDM, December 2-7, 2017, San Francisco, CA.
- On the Technical Committee of the 2016 International Electron Device Meeting (IEDM), December 3-7, 2016, San Francisco, CA.

Most important publications and presentations from the past five years –

Books:

- D. Vasileska and S. M. Goodnick, Computational Electronics, Morgan and Claypool, 2006.
- D. Vasileska, S. M. Goodnick and G. Klimeck, Computational Electronics: Semiclassical and Quan-tum Transport Modeling, Taylor & Francis, 2010.
- D. Vasileska, Editor, Cutting Edge Nanotechnology, In-Tech, March 2010.
- D. Vasileska and S. M. Goodnick, Editors, Nanoelectronic Devices: Semiclassical and Quantum Transport Modeling, Springer, July 2011.

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- K. Raleva, A. R. Shaik, D. Vasileska and S. M. Goodnick, Modeling Self-Heating Effects in Nanoscale Devices, IoP Concise Physics, Morgan & Claypool Publishers, 2017.

Recent Journal Papers:

- P. Muralidharan, S. M. Goodnick, and D. Vasileska, "Kinetic Monte Carlo simulation of transport in amorphous silicon passivation layers in silicon heterojunction solar cells," J. Computational Electronics, vol. 18, no. 4, pp. 1152-1161, 2019.
- V. V. A. Camargo, A. C. J. Rossetto, D. Vasileska and G. I. Wirth. "3-D Monte Carlo device simulator for variability modeling of p-MOSFETs", Journal of Computational Electronics (2020), https://doi.org/10.1007/s10825-020-01461-1 .
- A. C. J. Rossetto, V. V. A. Camargo, T. H. Both, D. Vasileska, and G. I. Wirth, "Statistical Analysis of the Impact of Charge Traps in p-type MOSFETs via Particle-Based Monte Carlo Device Simulations", J. Computational Electronics 19, pp. 648–657(2020). https://doi.org/10.1007/s10825-020-01478-6
- Chi-Yin Cheng and Dragica Vasileska, "Electron transport analysis of 4H-SiC with full-band Monte Carlo simulation including real-space Coulomb interactions", Journal of Applied Physics 127, 155702 (2020); https://doi.org/10.1063/1.5144214 .
- S. Altinoluk, N. Kumar, E. H. Ciftpinar, O. Demircioglu, R. Turan, and D. Vasileska, "Angular Dependence of Solar Cell Parameters in C-Si Solar Cells Textured with Periodic Array of Microholes", Wiley Online Library: Global Challenges: https://doi.org/10.1002/gch2.201900105 . Published online June 4, 2020, Global Challenges 4, pp. 1-5, 2020.
- Chi-Yin Cheng and Dragica Vasileska, "Static and Transient Simulation of 4H-SiC VDMOS Using Full-Band Monte Carlo Simulation That Includes Real-Space Treatment of the Coulomb Interactions", IEEE Trans. Electron Devices, Volume: 67, Issue: 9, pp. 3705-3710, 2020. Print ISSN: 0018-9383, Online ISSN: 1557-9646, https://doi.org/10.1109/TED.2020.3007368

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VISAR BERISHA

Associate Professor

EDUCATION:

- Ph.D., Electrical Engineering, Arizona State University, 2007
- M.S. Electrical Engineering, Arizona State University, 2005
- B.S., Electrical Engineering, Arizona State University, 2002

ACADEMIC EXPERIENCE:

Arizona State University, Tempe, Arizona

- Associate Professor, Electrical Computer and Energy Engineering and Speech and Hearing Science, 2019 – present, full time
- Assistant Professor, Electrical Computer and Energy Engineering *and* Speech and Hearing Science, 2013 – present, full time

NON-ACADEMIC EXPERIENCE:

- Raytheon Co, Tucson, Arizona; Principal Research Engineer, 2009 - 2013
- MIT Lincoln Laboratory, Boston, Massachusetts; Technical Staff, 2007 – 2009

PROFESSIONAL MEMBERSHIPS

- IEEE Member
- Acoustical Society of America Member

HONORS AND AWARDS

- College of Health Solutions Research Award, 2021
- 2016 Editor's Award for Journal of Speech, Language, and Hearing Research, 2016
- Harvard Business School New Venture Competition Finalist, (Southwest), 2015
- Vodafone Wireless Innovation Challenge Finalist, 2014

SERVICE ACTIVITIES

- IEEE Speech and Language Technical Committee
- Associate Editor for Journal of Alzheimer's Disease (2014 - 2016)
- Member of PhD Committee (SHS)

SELECTED PUBLICATIONS AND PRESENTATIONS IN THE LAST FIVE YEARS:

- Mathad, V., Scherer, N., Chapman, K., Liss, J. and Berisha, V., 2021. A Deep Learning Algorithm for Objective Assessment of Hypernasality in Children with Cleft Palate. IEEE Transactions on Biomedical Engineering. Jan 2021.
- Lubold, N., Willi, M., Barrett, T., Borrie, S., Berisha, V. Healthy communication partners modify their speech when conversing with individuals with Parkinson's disease. Journal of Speech, Language, and Hearing Research. In press.
- Stegmann, G.M., Hahn, S., Liss, J., Shefner, J., Rutkove, S.B., Kawabata, K., Bhandari, S., Shelton, K., Duncan, C.J. and Berisha, V., 2020. Repeatability of Commonly Used Speech and Language Features for Clinical Applications. Digital Biomarkers, 4(3), pp.109-122
- Rutkove, S.B., Narayanaswami, P., Berisha, V., Liss, J., Hahn, S., Shelton, K., Qi, K., Pandeya, S. and Shefner, J.M., 2020. Improved ALS clinical trials through frequent at-home self-assessment: a proof of concept study. Annals of Clinical and Translational Neurology.
- Stegmann, G.M., Hahn, S., Liss, J., Shefner, J., Rutkove, S., Shelton, K., Duncan, C.J. and Berisha, V., 2020. Early detection and tracking of bulbar changes in ALS via frequent and remote speech analysis. Nature digital medicine, 3(1), pp.1-5.
- Rutkove, S. B., Qi, K., Shelton, K., Liss, J., Berisha, V., & Shefner, J. M. (2019). ALS longitudinal studies with frequent data collection at home: study design and baseline data. Amyotrophic Lateral Sclerosis and Frontotemporal Degeneration, 20(1-2), 61-67.
- Wisler, A., Berisha, V., Spanias, A., & Hero, A. O. (2017). Direct estimation of density functionals using a polynomial basis. IEEE Transactions on Signal Processing, 66(3), 558-572.

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- Berisha, V., Wang, S., LaCross, A., Liss, J., Garcia-Filion, P. (2017). Longitudinal changes in linguistic complexity among professional football players. Brain and language, 169, 57-63.
- Hsu, S. C., Jiao, Y., McAuliffe, M. J., Berisha, V., Wu, R. M., & Levy, E. S. (2017). Acoustic and perceptual speech characteristics of native Mandarin speakers with Parkinson's disease. The Journal of the Acoustical Society of America, 141(3), EL293-EL299.
- Jiao, Y., Berisha, V., Liss, J., Hsu, S. C., Levy, E., & McAuliffe, M. (2017). Articulation entropy: An unsupervised measure of articulatory precision. IEEE Signal Processing Letters, 24(4), 485-489.
- LaCross, A., Liss, J., Barragan, B., Adams, A., Berisha, V., McAuliffe, M., & Fromont, R. (2016). The role of stress and word size in Spanish speech segmentation. The Journal of the Acoustical Society of America, 140(6), EL484-EL490.
- Tu, M., Wisler, A., Berisha, V., & Liss, J. M. (2016). The relationship between perceptual disturbances in dysarthric speech and automatic speech recognition performance. The Journal of the Acoustical Society of America, 140(5), ELR416-EL422.
- Dorman, M. F., Liss, J., Wang, S., Berisha, V., Ludwig, C., & Natale, S. C. (2016). Experiments on auditory-visual perception of sentences by users of unilateral, bimodal, and bilateral cochlear implants. Journal of Speech, Language, and Hearing Research, 59(6), 1505-1519. (2016 Editors Award)
- Berisha, V., Wisler, A., Hero, A. O., & Spanias, A. (2016). Empirically estimable classification bounds based on a nonparametric divergence measure. IEEE Transactions on Signal Processing, 64(3), 580-591.

RECENT PROFESSIONAL DEVELOPMENT:

- IEEE Conference on Acoustics and Speech Signal Processing, 2021
- Interspeech Conference, 2020
- NeurIPS Conference, 2020
- AISTATS Conference, 2020

VIJAY VITTAL

Education:

- B.M.S. College of Engineering, Bangalore, India, Electrical Eng., B.E.   1977
- Indian Inst. Of Technology, Kanpur, India,   Electrical Eng., M.T.   1979
- Iowa State University, Ames, Iowa, Electrical Eng.,   Ph.D.   1982

Academic Experience:

2005-   Present Regents' Professor, Ira A. Fulton Chair Professor, ASU Foundation Professor in Power Systems, School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ

2000 - 2004   Murray and Ruth Harpole Professor

1990 - 2004   Professor, Electrical Engineering and Computer Engineering Department

Iowa State University, Ames, IA

1986 - 1990   Associate Professor, Electrical Engineering and Computer Engineering Department Iowa State University, Ames, IA

1982 - 1986   Assistant Professor, Electrical Engineering and Computer Engineering Department Iowa State University, Ames, IA

Non-Academic Experience

1993-1994   Program Director for Power Systems, National Science Foundation, Division of Electrical & Communication Systems, Washington, DC

Current Membership in Professional Organizations

Life Fellow IEEE

Honors and Awards:

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2019   IEEE Power and Energy Society, Best Transactions Paper Award

2019   Inaugural Class of Foreign Fellows of the Chinese Society of Electrical Engineers

2018   IEEE Power and Energy Society, Prabha S. Kundur Power System Dynamics and Control Award

2018   Utility Variable-Generation Integration Group (UVIG) Achievement Award

2013   IEEE Herman Halperin Electric Transmission and Distribution Award – IEEE Technical Field Award

2004   Elected to the U.S. National Academy of Engineering

2000   Outstanding Power Engineering Educator Award

1997   Elected Fellow of the Institute of Electrical and Electronics Engineers

1985   Presidential Young Investigator Award, received from the President of the United States in recognition of research and teaching abilities

Service Activities:

2021 – 2023   IEEE Fellows Committee

2020 – 2022   IEEE PES Vice President for Technical Activities

2020 – 2022   IEEE PES Chair, Technical Council

2018 – 2020   IEEE PES Vice Chair, Technical Council

2016 – 2018   IEEE PES Secretary, Technical Council

2005 – 2011   Editor in Chief IEEE Transactions on Power Systems

Publications:

1. Sen Biswas, R., A. Pal, T. Werho, V., Vittal, "A Graph Theoretic Approach to Power System Vulnerability Identification," *IEEE Transactions on Power Systems*, Vol. 36, No. 2, pp. 923-935, March 2021.

2. Wang, Y., V. Vittal, M. Khorsand, and C. Singh, "Probabilistic Reliability Evaluation Including Adequacy and Dynamic Security Assessment," IEEE Transactions on Power Systems, Vol. 35, No. 1, pp. 551-559, January 2020.

3. Vittal, V., J. D. McCalley, P.M. Anderson, A.A. Fouad, Power System Control and Stability, 3rd Edition, Wiley Inter-Science/IEEE Press, 2019.

4. Huang, Q., and V. Vittal, "Integrated Transmission and Distribution System Power Flow and Dynamic Simulation Using Mixed Three-Sequence/Three-Phase Modeling," IEEE Transactions on Power Systems, Vol. 32, No. 5, pp. 3704-3714, September 2017.

5. Ramasubramanian, D., Z. Yu, R. Ayyanar, V. Vittal, and J. Undrill, "Converter Model for Representing Converter Interfaced Generation in Large Scale Grid Simulations," IEEE Transactions on Power Systems, Vol. 32, No. 1, pp. 765-773, January 2017.

Professional Development Activities

2005 – 2020   Director, NSF I/UCRC – Power Systems Engineering Research Center – One of NSF's largest I/UCRCs

2017   Sabbatical at three of India's leading technology institutions, - IIT Delhi, Indian Institute of Science, Bengaluru, and IIT Bombay – Taught courses and interacted with faculty on research. This led to the organization in 2019 of a US NSF, Japan ST, Norway SC, and India DST international workshop on cooperative research at IIT Bombay

2014   Served as a Ministry of Human Resource Development, India, external reviewer for the ECE Department at IIT Kanpur

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2007   Member of the National Research Council Committee to examine the vulnerability of the electric grid to malicious attacks.

CHAO WANG

EDUCATION   **Ph.D.** in Electrical Engineering, University of Wisconsin, Madison, 2009

M.S. in Computer Science, University of Louisianan, Lafayette, 2001

M.S. in Telecommunications, University of Louisiana, Lafayette, 2000

B.E. in Wireless Engineering, Beijing University of Posts and Telecommunications, 1998

ACADEMIC EXPERIENCE

2016 – present   Senior Lecturer, Ira A. Fulton Schools of Engineering, Arizona State University

2010 – 2016   Lecturer, Ira A. Fulton Schools of Engineering, Arizona State University

PROFESSIONAL MEMBERSHIP

Member, American Society for Engineering Education (ASEE) since 2015

Member, Institute of Electrical and Electronics Engineers (IEEE) since 2019

Member, IEEE Education Society since 2019

AWARDS AND HONORS

Engineering Unleashed Fellow, 2020

1st Place Award for Best Paper in the First-Year Programs Division, Best Professional Interest Council (PIC) III Paper and Best Overall PIC Paper, American Society for Engineering Education (ASEE) 2020 Annual Conference, June 2020

2nd Place Award from 2020 ASEE Best Card Competition, June 2020

Best Paper Finalist, First-Year Programs Division, American Society for Engineering Education (ASEE) 2015 Annual Conference, June 2015

SERVICE

Mentorship   Senior Design Project, "Drone Detection System via Radar", ECEE, ASU, Fall 2020, Spring 2021

Senior Design Project, "Auto-Follow System", ECEE, ASU, Spring 2018 – Fall 2018

Fulton Undergraduate Research Initiative (FURI) Project, "MYO – Integrated Hand Prosthesis", ASU, Spring/Summer 2018

Student Club "Society of Asian Scientist and Engineers", ASU 2019 - present

Student Club "Giraffe", ASU, 2017-18

Senior Design Project, "Calvary Band", ECEE, ASU, Fall 2016 – Spring 2017

Senior Design Project, "Smart Home Dynamic Lighting", EECE, ASU, Fall 2016 – Spring 2017

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Committees	FSE100 Curriculum Committee, Ira A. Fulton Schools of Engineering, ASU, 2019-2020
	Fulton Outstanding Lecturer Award Selection Committee, Ira A. Fulton Schools of Engineering, ASU, April 2017-18
	Standards Committee, Ira A. Fulton Schools of Engineering, ASU, 2015-19
	Senior Lecturer Promotion Committee, Ira A. Fulton Schools of Engineering, ASU, December 2016, 2018, 2019
Reviewer	American Society for Engineering Education (ASEE) Annual Conference, 2016-17, 2020-2021
	Frontier in Education (FIE), 2020
Others	Chair of IEEE Education Society Phoenix Chapter (2020 – present)

PUBLICATIONS

1. C. Wang, "A Brief Introduction of Python to Freshman Engineering Students Using Multimedia Applications," in Proc. Frontiers in Education 2019, Virtual Conference, October, 2020.
2. C. Wang, "Do Open-ended Design Projects Motivate First-year Engineering Students?," in Proc. 127st ASEE Annual Conference & Exposition, Virtual Conference, June, 2020.
3. C. Wang, A. Dixit, A. Spanias, S. Rao, "Introducing Machine Learning in a Sophomore Signals and Systems Course," in Proc. Frontiers in Education 2019, Cincinnati, Ohio, October, 2019.
4. M. Goryll, T. Thornton, C. Wang, S. Phillips, D. Allee, "Online Undergraduate Laboratories in Electrical Engineering," in Proc. Frontiers in Education 2019, Cincinnati, Ohio, October, 2019.
5. C. Wang, S. Phillips "Connecting Theory to Practice in an Online Introductory Signals and Systems Course," in Proc. Frontiers in Education 2018, San Jose, California, October, 2018.
6. C. Wang, "Teaching Entrepreneurial Mindset in a First Year Introduction to Engineering Course," in Proc. 124st ASEE Annual Conference & Exposition, Columbus, Ohio, June, 2017.
7. C. Wang and M. Goryll, "Design and Implementation of an Online Digital Design Course," in Proc. 123nd ASEE Annual Conference & Exposition, New Orleans, Louisiana, June, 2016.
8. C. Wang and J. Peuker, "Implementing Team Based Learning in a First Year Introduction to Engineering Course," in Proc. 122nd ASEE Annual Conference & Exposition, Seattle, Washington, June, 2015.
9. B. Mertz, H. Zhu, C. Wang, and T. Wilson, "Design, Implementation and Evaluation of an Online Team and Activity-Based Introduction to Engineering Course," In Proc. 122nd ASEE Annual Conference & Exposition, Seattle, Washington, June, 2015.

PROFESSIONAL DEVELOPMENT ACTIVITIES

KEEN 200-300 Workshop, ASU, Fall 2019 & Spring 2020

KEEN Workshop on Motivation and Mindset, Atlanta, Georgia, August 12-15, 2019

Hacking for Defense Educators Course, Ann Arbor, Michigan, June 5 – 7, 2019

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EDUCATION AND TRAINING

2006–2011   Ph.D.   Dept. Electrical Engineering, Princeton University   2006-2008   Master of Arts   Dept. Electrical Engineering, Princeton University 2003-2006   Master of Science   Institute of Microelectronics, Tsinghua Univ.

1999-2003   Bachelor of Engineering   Dept. Electrical Engineering, Tsinghua Univ.

POSITIONS AND EMPLOYMENT

- 2016.2–   Assistant Professor, Arizona State University
- 2015.1–2016.1 Research Assistant Professor, Arizona State University
- 2012.3–2014.12 Postdoctoral research scientist, IBM T.J. Watson research center

RESEARCH AND PROFESSIONAL EXPERIENCE

- Member, EIPBN conference program committee

- Member, Materials Research Society

- Reviewer, NSF CMMI Nanomanufacturing panel

- Member, American Physical Society

- Member, ASU Nanofab Governance Board

- Member, Institute of Electrical and Electronics Engineers

- Reviewer, NSF CCF Foundations of Emerging Technologies panel

ASU INTERNAL SERVICE

2021.2 -   ASU ECEE faculty search committee (Quantum information processing).

2019.2 -   ASU FURI faculty committee.

2019.7 -   ASU Nanofab Governance Board member.

2019.9 -   ECEE communications committee

HONORS AND AWARDS (SELECTED)

2019   NSF CAREER award

2013   IBM Invention Achievement Patent Plateau award.

2011   Princeton EE department Outstanding Teaching Assistant Award 2006   Graduate Fellowship, Princeton University.

SYNERGISTIC ACTIVITIES

- Reviewer of 21 scientific journals:
- Member of program committee of the International conference on Electron, Ion, and Photon Beam Technology and Nanofabrication (EIPBN, 2015 to present).
- Instructor of a senior design project of ASU undergraduate students (2018). Topic: Design a portable, handheld, smartphone spectrometer.

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- Education and outreach activities: 2018/2020: ASU Open Door. The PI's lab hosted visitors interested in liquid biopsy and biosensing. 2018.3: DISCOVER The Fulton Schools. The PI discussed with high-school students from Arizona interested in ECEE programs at ASU,
- Undergraduate students mentoring: 5 students (Connie Kwok, Gideon Kamau, Vaughn Mcgill Adami, Jonathan Zhao, and Chau Nguyen)
- High-school student mentoring: 7 students, from 2017 to now.

REFEREED PUBLICATIONS (SELECTED, THE PAST 4 YEARS ONLY)

- Xiahui Chen †, Md Ashif Ikbal, Shoukai Kang, Zhi Zhao, Jiawei Zuo, Yu Yao, Liangcai Gu*, and Chao Wang*, "Rapid Electronic Diagnostics of Ebola Virus with Synthetic Nanobody-Conjugated Gold Nanoparticles," Under preparation, bioRxiv 2021.05.09.443341.
- Zhi Zhao †, Xiahui Chen, Jiawei Zuo, Ali Basiri, Shinhyuk Choi, Yu Yao, Yan Liu *, and Chao Wang *, " Deterministic Assembly of Single Emitters in Sub-5 Nanometer Optical Cavity Formed by Gold Nanorod Dimers on Three-Dimensional DNA Origami ", Under review, arXiv:2104.02916.
- Pengkun Xia †, Jiawei Zuo, Pravin Paudel, Shinhyuk Choi, Xiahui Chen, Md Ashiqur Rahman Laskar, Jing Bai, Weisi Song, JongOne Im, and Chao Wang *, "Sapphire-Supported Nanopores for LowNoise DNA Sensing," *Biosensors and Bioelectronics,* vol. 174, pp. 112829, 2020.
- Zhi Zhao †*, Jing Bai, Yu Yao, and Chao Wang*, "Printing Continuous Metal Structures via PolymerAssisted Photochemical Deposition," *Materials Today,* vol. 37, pp. 10-17, 2020.
- Zhi Zhao †, Chao Wang, Hao Yan *, and Yan Liu *, "Soft Robotics Programmed with Double Crosslinking DNA Hydrogels," *Advanced Functional Materials*, pp. 1905911, 2019.
- Jing Bai †, Chu Wang, Xiahui Chen, Ali Basiri, Chao Wang, and Yu Yao *, "On Chip-Integrated Plasmonic Flat Optics for Mid-Infrared Full-Stokes Polarization Detection," *Photonics Research*, vol. 7, pp. 1051-1060, 2019.
- Ali Basiri †, Xiahui Chen, Pouya Amrollahi, Jing Bai, Joe Carpenter, Zachary Holman, Chao Wang *, and Yu Yao *, "Nature-Inspired Chiral Metasurfaces for On-Chip Circularly Polarized Light Detection," *Light: Science & Applications,* vol. 8, pp. 78, 2019.

RESEARCH SUPPORT (SELECTED)

- Title: CAREER: Integrated Optofluidic Chips towards Label-Free Detection of Exosomal MicroRNA Biomarkers. Source of Support: NSF. Award Amount: $ 500,000. Wang lab Allocation: $ 500,000. Period Covered: 7/1/2019-6/30/2024.
- Title: Photochemically Induced, Polymer-Assisted Deposition for 3D Printing of Micrometer-Wide and Nanometer-Thin Silver Structures. Source of Support: NSF. Award Amount: $ 485,487. Wang lab Allocation: $ 364,115. Period Covered: 1/1/2020-12/31/2022.
- Title: Polarimetry-Enhanced Imaging towards Autonomous Solar Field and Receiver Inspections. Source of Support: DOE: Office of Energy Efficiency and Renewable Energy (EERE). Award Amount: $ 1,984,722. Wang lab Allocation: $ 595,416. Period Covered: 3/1/2020-2/28/2023.
- Title: NSF-BSF: Synchronous electro-optical DNA detection using low-noise dielectric nanopores on sapphire. Source of Support: NSF. Award Amount: $ 360,000. Wang lab Allocation: $ 360,000. Period Covered: 7/1/2020-6/30/2023.
- Title: SemiSynBio-II: DNA-based Memory for High-Density Information Storage and Molecular Cryptography with Fast Readout Methods. Source of Support: NSF. Award Amount: $ 1,500,000. Wang lab Allocation: $ 450,000. Period Covered: 10/01/2020-09/30/2023.

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YANG WENG

Assistant Professor

EDUCATION

Huazhong University of Science & Technology, Wuhan, China, B.S., 2006

University of Illinois at Chicago, Chicago, Statistics, M.S., 2009

Carnegie Mellon University, Pennsylvania, Electrical Computer Engineering, M.S., 2013

Carnegie Mellon University, Pennsylvania, Machine Learning, M.S., 2014

Carnegie Mellon University, Pennsylvania, Electrical Computer Engineering, Ph.D., 2014

ACADEMIC EXPERIENCE

Years	Position
2017 – present	Assistant Professor, School of Electrical, Computer and Energy Engineering, Arizona State University
2014 – 2016	Post-Doctoral Fellow, Precourt Institute for Energy, Stanford University

CURRENT MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

IEEE Senior Member

HONORS AND AWARDS

- NSF CARRER Award, National Science Foundation, 2021
- Certificate of Merit Award, Analytic Methods for Power Systems (AMPS) Committee, IEEE Power and Energy Society, 2020
- Centennial Award, Graduate & Professional Student Association (GPSA), ASU, 2020
- Outstanding IEEE Young Professional, IEEE Phoenix Section, 2020
- Outstanding Faculty Mentor Award, Graduate School, ASU, 2020
- Best Paper Award, IEEE Sustainable Power & Energy Conference, 2019
- Best Paper Award, IEEE Conference on Energy Internet and Energy System Integration, 2018
- Best Paper Award, IEEE International Conference on Probabilistic Methods Applied to Power Systems, 2017
- Best Paper Award at the IEEE International Conference on Smart Grid Communications, Taiwan, 2012

SERVICE ACTIVITIES

- Consortium Chair, Comprehensive Cybersecurity Technology for Critical Power Infrastructure AI-Based Centralized Defense and Edge Resilience, Israel-U.S. Binational Industrial Research and Development Foundation, 2021 - Now
- Chair, Taskforce on Tutorial, IEEE PES Big Data & Analytics Subcommittee, 2017 - Now
- Chair, IEEE Phoenix Section - Conference Committee, 2019 - Now
- Publication Co-Chair, IEEE North American Power Symposium, 2021
- Chair, Tutorials, IEEE International Conference on Communications, Control, and Computing
- Technologies for Smart Grids (SmartGridComm), 2020
- Tutorial Speaker, Machine Learning and Big Data Analytics in Smart Grid, IEEE PES General Meeting, Montreal, Canada, 2020

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KEY RELATED PUBLICATIONS (GOOGLE SCHOLAR H-INDEX = 20 AS OF FEB 2020)

- Y. Weng, J. Yu, R. Rajagopal, "Probabilistic Baseline Estimation Based on Load Patterns for Better Residential Customer Rewards", International Journal of Electrical Power & Energy Systems" vol. 100, pp. 508-516, 2018.
- Xie, X. Chen, and Y. Weng, "An Integrated Gaussian Process Modeling Framework for Residential Load Prediction", IEEE Transactions on Power Systems, 2018.
- P. Li, B. Zhang, Y. Weng and R. Rajagopal, "A Sparse Linear Model and Significance Test for Individual Consumption Prediction," IEEE Transactions on Power Systems, vol. 32, no. 6, pp. 4489-4500, Nov. 2017.
- Y. Liao, Y. Weng, and R. Rajagopal, "Urban MV and LV Distribution Grid Topology Estimation via Group Lasso", IEEE Transactions on Power Systems, 2018.
- Y. Weng, Y. Liao and R. Rajagopal, "Distributed Energy Resources Topology Identification via Graphical Modeling," in IEEE Tran. on Power Systems, vol. 32, no. 4, pp. 2682-2694, 2017.
- Q. Cui, Y. Weng, and C. Tan, "Electric Vehicle Charging Station Placement Method for Urban Areas", IEEE Transactions on Smart Grid, 2019
- J. Yu, Y. Weng, and R. Rajagopal, "PaToPaEM: A Data-Driven Parameter and Topology Joint Estimation Framework for Time Varying System in Distribution Grids", IEEE Transactions on Power Systems, 2018.
- Y. Weng, R. Negi, and M. Ilic, "Probabilistic Joint State Estimation for Operational Planning", IEEE Transactions on Smart Grid, 2017.

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MARNIE WONG

Education

Master of Science, Electrical Engineering, Arizona State University, Dec. 2006

Academic experience

Arizona State University, Senior Lecturer, 2015 – current, full time

Non-academic experience

- Cactus Semiconductor, Product Engineer, Jan. 2015 – June 2015, Part Time
- Boot Camp Babes, Owner and Trainer, Apr. 2011 – Dec. 2014, Business Owner
- IDT, Senior Analog Design Engineer, Jun. 2010 – Jun. 2011, Part Time
- Freescale Semiconductor, Senior Analog Design Engineer, May 2003 – Jun. 2010, Full Time

Certifications or professional registrations –

- Master Online Teaching Certification, Arizona State University, Oct 2016

Current membership in professional organizations

ASEE (American Society for Engineering Education)

Honors and awards

Top 5% Teaching Award, Arizona State University, 2020-21

Service activities (within and outside of the institution)

- Fulton Schools of Engineering Academic and Student Affairs Personnel Committee member
- Faculty Advisor to the ASU Women's Ultimate Frisbee team (Caliente)

Most important publications and presentations from the past five years

Work in Progress: Incorporating Active Learning and the Entrepreneurial Mindset into a First-level Electrical Circuits Course, Wong M., Mayled L., American Society for Engineering Education National Conference, June 2020.

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MENG WU

Education

- Texas A&M University, College Station, TX, Ph.D. in Electrical and Computer Engineering, December 2017
- Cornell University, Ithaca, NY, M.Eng. in Electrical and Computer Engineering, June 2011
- Tianjin University, Tianjin, China, B.Eng. in Electrical Engineering and Automation, July 2010

Academic experience

- Arizona State University, Tempe, AZ, School of Electrical, Computer and Energy Engineering Assistant Professor, January 2018-present
- Texas A&M University, College Station, TX, Department of Electrical and Computer Engineering Graduate Research Assistant and Teaching Fellow, 8/ 2013 – 12/2017

Non-academic experience

- Independent System Operator (ISO) New England, Holyoke, MA Business Architecture and Technology Department Research Intern, May 2016 – August 2016, Full Time
- Beijing Sifang Automation Co. Ltd, Beijing, China Research and Development Center, Power System Control Department Research Engineer, May 2012 – June 2013, Full Time
- China Electric Power Research Institute (China EPRI), Beijing, China
  Power System Department Research Engineer, August 2011 – May 2012, Full Time

Current membership in professional organizations

- Member, IEEE Power and Energy Society.

Honors and awards

- Paper Selected in the Best Conference Papers Session, 51st North American Power Symposium, Wichita, KS, 2019.
- Best Project Poster Award, Power System Engineering Research Center (PSERC) Industry Adisory Board (IAB) meeting, 2015.
- Ebensberger Fellowship, Department of Electrical and Computer Engineering, Texas A&M University, 2015.
- Graduate Teaching Fellow, College of Engineering, Texas A&M University, 2015.
- Outstanding PhD Student Award, Department of Electrical and Computer Engineering, Texas A&M University, 2015.
- One-Time Graduate Merit Scholarship, Department of Electrical and Computer Engineering, Texas A&M University, 2013.

Service activities (within and outside of the institution)

- Technical program committee member, 2018~2020 IEEE International Conference on Communications, Control, and Computing Techniques for Smart Grids (SmartGridComm).
- Secretary, Research Subcommittee of IEEE Power and Energy Society Education Committee (PEEC), 2020-present.

Important publications and presentations from the past five years

- Adriana Cisco Sullberg*, Meng Wu, Vijay Vittal, Bo Gong, and Philip Augustin, "Examination of Composite Load and Variable Frequency Drive Air Conditioning Modeling on FIDVR", IEEE Open Access Journal of Power and Energy, vol. 8, pp. 147-156, 2021.
- Tong Huang*, Meng Wu, and Le Xie, "Prioritization of PMU Location and Signal Selection for Monitoring Critical Power System Oscillations", IEEE Transactions on Power Systems, vol. 33, no. 4, pp. 3919-3929, Jul. 2018.
- Meng Wu*, and Le Xie, "Calculating Steady-State Operating Conditions for DFIG-Based Wind Turbines", IEEE Transactions on Sustainable Energy, vol. 9, no. 1, pp. 293-301, Jan. 2018.

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- Meng Wu*, and Le Xie, "Online Detection of Low-Quality Synchrophasor Measurements: A Data-Driven Approach", IEEE Transactions on Power Systems, vol. 32, no. 4, pp. 2817-2827, Jul. 2017.
- Meng Wu*, Le Xie, Lin Cheng, and Rongfu Sun, "A Study on the Impact of Wind Farm Spatial Distribution on Power System Sub-synchronous Oscillations", IEEE Transactions on Power Systems, vol. 31, no. 3, pp. 2154-2162, May 2016.

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JUNSHAN (JOSH) ZHANG

Education

Aug. 2000   Ph.D., ECE, Purdue University, West Lafayette, IN 47907.

Dec. 1996   M.Sc., Mathematical Statistics, University of Georgia, Athens, GA 30602.

July 1993   B.E., EE, Huazhong Univ. of Science & Technology (HUST), China.

Professional Experience

07/2015 -,   *Ira A. Fulton Chair Professor*, School of ECEE, ASU, Tempe, AZ 85287.

08/2015–08/2017,   *Co-founder and CTO*,   Smartiply Inc, Basking Ridge, NJ 07920.

07/2010–,   *Professor*,   School of ECEE, ASU, Tempe, AZ 85287.

07/2009–,   *Graduate Faculty*,   Computer Science program, ASU, Tempe, AZ 85287.

08/2005–06/2010,   *Associate Professor*,   School of ECEE, ASU, Tempe, AZ 85287.

05/2007–06/2007,   *Visiting Associate Professor*,   Dept. EE, Princeton University

01/2007–03/2007,   *Visiting Associate Professor*,   Dept. of ECE, Univ. of Illinois at Urbana Champaign
08/2000–07/2005,   *Assistant Professor*,   Department of EE, ASU, Tempe, AZ 85287.
01/1997–06/2000,   *Research Assistant*,   School of ECE, Purdue Univ., West Lafayette, IN 47907.

09/1995–12/1996,   *Teaching Assistant*,   Dept. of Statistics, Univ. of Georgia, Athens, GA 30602.
Entrepreneurship: Building on my research findings, I co-founded Smartiply Inc. in 2015, a Fog/edge Computing startup company delivering boosted connectivity and embedded artificial intelligence. Smartiply Inc was acquired by a Global Fortune 500 company in 2020.

Awards and Leadership/Distinctions:

- Keynote Speaker of the 2020 GLOBECOM Workshop on Edge Learning, Taipei, Taiwan, Dec 2020.
- Keynote Speaker of the ICNP workshop on AIMCOM2, Madrid, Spain, Oct. 2020.
- Keynote Speaker of the 26th International Computing and Combinatorics Conference, Atlanta, GA, Aug 2020.
- Keynote Speaker of 16th conference on Modeling and Optimization in Mobile, Ad-Hoc and Wireless Networks (WiOPT'2018).
- WiOPT 2018 Best Student Paper award, 2018.
- Plenary speaker at ICNC 2018, Maui, Hawaii.
- IEEE ICC 2017 Best Paper Award.
- Kenneth C. Sevcik Outstanding Student Paper Award of ACM SIGMETRICS 2016.
- IEEE Wireless Communications Technical Committee Recognition Award 2016.
- IEEE INFOCOM 2014 Best Paper Award Runner-up.
- Keynote speaker at WASA 2014.
- IEEE Fellow (for contributions on cross-layer optimizations in wireless networks), 2012.
- IEEE INFOCOM 2009 Best Paper Award Runner-up.
- IEEE ICC 2008 Best Paper Award.
- ONR YIP (Office of Naval Research Young Investigator) award, 2005.
- NSF CAREER award, 2003.
- Editor-in-Chief, IEEE Transactions on Wireless Communications, 01/01/2019–.
- WTC Award Committee, IEEE Communication Society, 2017, 2018, 2019, 2020
- CTTC Award Committee, IEEE Communication Society, 2019, 2020
- IEEE Communication Society Award Committee, 2015– 2017.
- General chair of ACM/IEEE SEC 2017.
- General Co-chair of WiOPT 2016.

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- TPC Program Co-chair of ACM MOBIHOC 2015.
- IEEE Communications Society Award Committee member (2015–2017).
- IEEE Communications Society Distinguished Lecturer (2013–2014).
- TPC co-chair of INFOCOM 2012.
- TPC co-chair of ICCC 2012.
- Interviewed by Wall Street Journal (personal technology) on CDMA vs. GSM technologies for next generation iPhone on Oct. 7th 2010.
- One journal paper was featured by the Technical Insights division of Frost & Sullivan, the largest global growth consulting firm www.ti.frost.com.
- One-year earlier tenure promotion, 2005.
- Outstanding Research Award from IEEE Phoenix Section, 2003.

References for Tenure/Promotion

- Have served as a reference for tenure/promotion cases at many universities, including Princeton University, Carnegie Mellon University, Ohio State University, Univ of Pennsylvania, Cornell University, Virginia Tech, and many other Universities.

Honor Societies and Other Honors: IEEE, ACM, ASEE

Appendix C – Program Assessment Plans and Assessment Reports