ASU Postdoc

Individual Development Plan

and Resume Guide

ASU Graduate College

Arizona State University

Dear postdoctoral scholars,

It's my pleasure to welcome you to Arizona State University In 2018, we launched the ASU Postdoctoral Affairs Office with the purpose of making sure you have a great experience during your time at ASU, but also to make sure you are well-prepared for your next adventure, whether it be in education, industry, government or entrepreneurship. Take this opportunity to learn as much as possible about a variety of career paths. This booklet is designed to guide you and provide assistance and resources as you explore your chosen career path. Know that we are here if you need anything or have any questions.

My best,

Alfredo Artiles, Dean
ASU Graduate College

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Professional development resources for ASU postdoctoral scholars

Postdoctoral Affairs Office
graduate.asu.edu/postdocs

The Graduate College hosts many events throughout the year to enrich your experience at ASU as a postdoc. Please review the events listed online for upcoming opportunities.

- Lunch and Learns.
- Mentoring programs.
- Postdoc Career Conference.
- National Postdoc Appreciation Week.
- Arizona Postdoc Research Conference.
- Postdoc Press newsletter.

Graduate College
graduate.asu.edu

The ASU Graduate College endeavors to enrich and advance the graduate school experience for all students and postdoctoral scholars, promoting a student-centered culture and commitment to inclusion and innovation that make it easy to see why U.S. News & World Report selected ASU as the most innovative university in the country five years in a row.

The extraordinary innovations produced in ASU's Graduate College are fueled by the quality of our programs, the diversity of our ideas, the social embeddedness of our work, and the intellectual assets of our graduate student population that represents more than 100 nations and myriad backgrounds.

- Preparing Future Faculty and Scholars (PFx).
- Knowledge mobilization.
- HUES and SHADES.
- Graduate Insider newsletter.

Postdoc and Early Career Research Network
links.asu.edu/ECRN

The postdoc network provides leadership opportunities and experience in assisting the postdoc office with planning and organizing activities. Contact the postdoc office for more information.

Graduate and Professional Student Association
gpsa.asu.edu

Giving a voice to graduate and professional students across ASU, GPSA promotes success, inclusion and vitality among the diverse communities it represents and serves. GPSA seeks to foster and empower the next generation of academic and professional leaders through professional development, advocacy and service opportunities.

ASU Career and Professional Development Services
careerservices@asu.edu or visit career.asu.edu

ASU's career services is committed to your individual career success. The following services are offered both in person and virtually:

- One-on-one career advising.
- Hiring events and professional. development workshops.
- Internship and full-time job postings.
- On-campus interviews.
- Assessments.
- Employer information sessions, panels and virtual company site visits.

Reach out — they are happy to guide you.

ASU Continuing and Professional Education
cpe.asu.edu

ASU Continuing and Professional Education is dedicated to improving the skills and talents of working professionals and lifelong learners through high-quality courses that expand opportunity, fulfill passions and positively impact the future of individuals, organizations, and businesses. Hundreds of courses are offered in areas such as business, accounting, entrepreneurship, history and sustainability.

International Center Students and Scholars
issc.asu.edu

As a top public university chosen by international students, the ISSC serves international students across ASU's five campuses. The office serves more than 700 international scholars and faculty members that come to ASU for our research facilities and expanding international partnerships. The ISSC offers services and workshops to assist international students and scholars with all aspects of ASU life.

ASU Counseling Services
eoss.asu.edu/counseling

ASU Counseling Services offers confidential, time-limited professional counseling and crisis services for Sun Devils experiencing emotional concerns, problems adjusting, and other factors that affect their ability to achieve their academic and personal goals. Office staff will talk with you, help you identify solutions or support, and connect you with those services at ASU or in the community.

Ira A. Fulton Schools of Engineering Career Center
career.engineering.asu.edu

Whether you want to pursue specialized training, find a new job, mentor a current student or network through the Ira A. Fulton Schools of Engineering Alumni Association, the FSE Career Center has a multitude of opportunities to help you stay connected and further your own professional experience.

Join
Handshake

– your online hub to find internships and jobs, schedule career advising appointments, discover events and more. Visit:
asu.joinhandshake.com

With Handshake, you can:

» Explore thousands of jobs available to you.
» Track deadlines and show off your best self to employers.
» Discover jobs in collections customized for you.
» Connect with employers.
» Find career fairs and other hiring events.

This is ASU's main portal for career services.

Join today!

Training timeline

	Year 1
Self-assessment and development	» Attend the New Postdoc Reception. » Complete an Individual Development Plan (IDP). and discuss the plan with your advisor. » Draft a timeline of experiences you want to gain in your postdoc. » Schedule monthly professional development (mentoring) meetings with your advisor.
Career path preparation	» Create a Linked In profile. » Update your curriculum vitae. » Create a resume form of your CV. » Attend networking events to meet other faculty and postdocs. » Review job ads and become familiar with what is required and expected.
Communication skills	» Attend workshops and develop skills in handling conflict, managing up and presentation. » Identify important journals in your field for potential publishing opportunities.
Project management and leadership	» Attend workshops offered by the postdoc office and the ASU Project Management Network. » Volunteer for committees in and outside your department.
Teaching and mentorship	» Attend teaching workshops and seminars. » Audit a course.

Year 2	Years 3–4
» Review your IDP with your advisor. » Consider adding an additional mentor from outside academia.	» Review your IDP, revise your goals and update your action plan. » Discuss your plans with your mentor team.
» Update your resume, CV and LinkedIn profile regularly (every three months). » Conduct discovery interviews with professionals in your field who are in industry, academia, government and entrepreneurial ventures. » Volunteer at professional conferences and meetings. » Network with professionals outside of academia.	» Finalize application materials. » Search and apply for job openings. » Keep in touch with relevant professional. contacts you have met over the past 2–3 years. » Meet with references and inform them of your plans and goals. » Keep LinkedIn, Twitter and ResearchGate profiles up to date.
» Join a writing group. » Present your research at conferences, department talks and poster sessions. » Submit at least one article for publication. » Begin working on teaching, research and diversity statements for future applications.	» Develop a summary of your research and adapt for diverse audiences. » Draft application materials relevant for your employment objective.
» Take a leadership role on a team or committee. » Collaborate on an interdisciplinary project. » Apply for outside funding and grants.	» Lead or serve as a lead on a project or paper. » Prepare a lab management plan. » Begin researching early-career awards.
» Attend teaching workshops and seminars. » Mentor graduate students. » Observe a faculty-taught course or assist your principal investigator in developing a syllabus or curriculum for a course.	» Attend teaching workshops and seminars. » Mentor graduate students. » Consider applying for a teaching-focused postdoc fellowship.

Online assessments and resources for postdoctoral scholars

The National Science Foundation and the National Institute of Health define a postdoctoral scholar as an individual holding a doctoral degree who is engaged in a temporary period of mentored research or scholarly training for the purpose of acquiring the professional skills needed to pursue a career path of their choosing.

Individual Development Plans are a critical tool to help keep postdocs on task and on track for completing this supplementary training, and to get them on their way to the career of their choosing. There are many resources available to postdocs (many of them free) to help guide this period of training.

AAAS – myIDP for science careers

myidp.sciencecareers.org

In 2003, the Federation of American Societies for Experimental Biology proposed an IDP framework for postdoctoral fellows in the sciences. AAAS/Science joined forces with FASEB and experts from several universities (see authors below) to expand on that framework. The result is myIDP — a unique, web-based career-planning tool tailored to meet the needs of PhD students and postdocs in the sciences.

myIDP provides:

- Exercises to help you examine your skills, interests and values.
- A list of 20 scientific career paths with a prediction of which ones best fit your skills and interests.
- A tool for setting strategic goals for the coming year with optional reminders to keep you on track.
- Articles and resources to guide you. through the process

ImaginePHD

imaginephd.com

ImaginePhD is a free online career exploration and planning tool for PhD students and postdoctoral scholars in the humanities and social sciences.

Humanities and social sciences PhD students and their mentors have long recognized the need for more resources to help bridge the knowledge gap between doctoral education and the realm of career possibilities. ImaginePhD is designed to meet this need by allowing users to:

- Assess their career-related skills, interests and values.
- Explore careers paths appropriate to their disciplines.
- Create self-defined goals.
- Map out next steps for career and professional development success.

Next steps:

Select one of the online IDP tools and proceed through the instructions and assessments that the tool offers.

Record your **username and password** here for easy access:

Username: _____

Password: _____

My individual development plan online resources

Utilize one of the previously mentioned online resources to do a skills, interests and values assessment of your professional profile. This may take 1–2 hours and can be done in more than one sitting. Take your time and answer carefully and thoughtfully. Then, use the results of the online resource to complete the following worksheets.

Self-assessment summary

Strong skills	1. _____ 2. _____ 3. _____ 4. _____ 5. _____
Weak skills	1. _____ 2. _____ 3. _____ 4. _____ 5. _____
Top interests	1. _____ 2. _____ 3. _____ 4. _____ 5. _____
Activities to avoid	1. _____ 2. _____ 3. _____ 4. _____ 5. _____
Top values	1. _____ 2. _____ 3. _____ 4. _____ 5. _____

My career path matches

Using the reports generated on your online IDP assessments, copy the information from the online report into the following tables.

Career path	Skills match	Interest match	Values match

Read about careers

In an effort to learn more about your possible career matches, search for articles and editorials about working in the fields mentioned on the previous page. Record the articles, the summaries, and your thoughts and impressions about the career path in the table below.

Date	Career	Article	Notes and impressions

Attend events

Attending trade shows, conferences and meetings related to your potential career path can be a good way to gather data about whether that career path is for you. Attend industry events related to your career path, and record your impressions below.

Date	Career	Event	Notes and impressions

Industry lists

Science, technology, engineering and math

- STEM education in K-12 schools.
- Support of science and engineering-related products.
- Science and technology policy.
- Science and technology education and outreach.
- Public health-related careers.
- Teaching-intensive careers in academia.
- Intellectual property.
- Science writing.
- Sales and marketing of science and engineering products.
- University and research administration.
- Clinical practice.
- Scientific and medical testing.
- Research and teaching careers in academia.
- Business of science and consulting.
- Clinical research management.
- Entrepreneurship.
- Drug and device approval and production.
- Research in industry.
- Big data.

Social science, humanities and education

- Public education.
- Higher education administration.
- Administration and management.
- Research, assessment and analysis.
- Writing, publishing and editing.
- Consulting.
- Entrepreneurship.
- Communications, public relations and marketing.
- Human services.
- Advocacy.
- Performance and fine arts.
- Development and fundraising.
- Diplomacy and mediation.
- Research and teaching careers in academia.
- Teaching-intensive careers.
- Translation and interpretation.
- Data management.

Career discovery interviews

Career discovery interviews are conversations to help you learn about organizations, career paths and industry trends from a professional in a field of interest. These are not job interviews. They are designed to help you learn more about a particular job or industry to determine if it is something you have interest in pursuing. Your job is to ask questions, listen and learn — the less talking you do, the better.

When you reach out to a potential interviewee, communicate these three things:

The best interviews are conversations done in person. Do everything in your power to get an in-person interview so you can see body language and nonverbal communication. You are more likely to have their full attention if you are right there in the same room. A phone or Skype interview is better than none at all, but the quality of the information you get from an in-person interview is much better.

Sample interview questions

When interviewing contacts to learn about potential career paths, it is important to be prepared and have a set list of questions to ask during your 30-minute interview. It is also important to let the interviewee do the talking. Ask questions and let them answer. This is not a job interview, and this is not the time to tell the interviewee about your research. Have a set of questions that are of genuine interest to you.

Feel free to pick from the following list of questions:

- What are your major responsibilities?
- What is the most interesting project you have worked on?
- What is the most or least rewarding aspect of your job?
- Would you choose this career again? Why or why not?
- What is a typical day like?
- What are the main things you try to accomplish in a given week?
- What are some lifestyle considerations for this career field?
- What are some common entry-level positions in this field?
- What is the salary range and benefits for an entry-level job in this field?
- What kind of skills or personality are best suited for these kinds of positions?
- What are the important factors used when hiring for this kind of position?
- What is the best educational preparation for a career in this field?
- Which classes and experience would be most helpful to obtain while still in my program?
- How does someone move or advance within the organization?
- How do people find out about open positions in this field?
- What should I emphasize on my CV or resume?
- How is the industry changing? What skills will I need down the road?
- What journals or publications would you recommend to learn more about this field?
- Who else should I talk with about this industry?

Always send a thank-you note after the interview.

1. Thank them for their time and for any resources that they provided or offered during the interview.
2. Explain how you plan to use their advice, or share how you have already applied what you have learned from the discussion.
3. If they offered additional contacts or resources, let them know if you have reached out to those individuals.
4. Do not ask for a job or send your resume unless they offered or expressed interest during the meeting.

Informational interviewing process

Perhaps the most effective way to learn about a highly specialized career is to get advice from someone who has traveled down that path before you. The process of gathering information about a career path from another professional who is experienced in that field is called "informational interviewing."

Through the informational interviewing process, you can learn:

- The pros and cons of a career path.
- How to make a successful transition onto that new path.
- How to conduct an effective job search in that field.

How to conduct an informational interview:

1. Email an invitation to your informational interview target.
2. Tell them that you seek advice, not a job offer.
3. Ask to set up a 30-minute appointment to talk, in person if possible, or by Skype or phone.
4. Take a customized list of questions to your meeting.
5. Conduct the informational interview.
6. Follow up with a thank-you note.
7. If appropriate, follow up periodically.

Date:	
Name, job title:	
Notes:	

Date:	
Name, job title:	
Notes:	

Date:	
Name, job title:	
Notes:	

Date:	
Name, job title:	
Notes:	

Date:	
Name, job title:	
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Date:	
Name, job title:	
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Date:	
Name, job title:	
Notes:	

Date:	
Name, job title:	
Notes:	

Notes:

Career plans summary

Based on what you have learned in your reading, attending events and interviewing people who work in the industries in which you have an interest, record your first and second career choices below.

The long-term goal is your ultimate career goal. This may be a position which takes you five or 10 years to achieve. Example: Director of a research and development lab in a Fortune 500 chemical company.

The short-term goal is your plan for the next two to five years: from your postdoc to your first professional job in your field, to the mid-level positions and steps that you will need to ultimately get to your long-term goal.

Briefly describe the long- and short-term goals for your top-two career choices below.

Plan A

Long-term goal:
Short-term goal:

Plan B

Long-term goal:
Short-term goal:

Building your professional network

It is important to build a close network of personal and professional mentors and advisors. This list should represent where you are at this point in your career. It will change over time. People you have lost contact with will drop off, and other new contacts will be added.

Professional development	Internal	**1**
		2
	External	**1**
		2
Research community	Peers	**1**
		2
	External collaborators	**1**
		2
	Faculty	**1**
		2
Mentors	Peers	**1**
		2
	Internal	**1**
		2
	External	**1**
		2
Emotional support	Friends or family	**1**
		2
	Other	**1**
		2
Organizations	Supportive individuals	**1**

Applying for industry jobs

Putting together a job search plan

It is a good idea to put together a job search plan to give you structure and clear tasks, help you stay organized, and not get frustrated. The average time to secure a job is 6–12 months. Depending on where you are in your program and your career goals, consider how much time you need to devote to your job search. Cover letters and resumes should be customized to each job opening and job description. Therefore, applying for jobs can be a time-consuming process. Balancing this with your current job duties, writing for publication and lab work can be challenging.

How much time do you intend to commit to your job search on a weekly basis?

How will you search for openings?

Name five contacts you will reach out to.

1. _____
2. _____
3. _____
4. _____
5. _____

Using Handshake

Handshake is ASU's Career and Professional Development Services' job assistance portal. It is free and available to ASU students and staff. Handshake guides users through the process of exploring interests, getting prepared, building experience and getting hired. It is home to job openings, internships and hiring events available to ASU students and staff. It is especially important if you want to participate in ASU-sponsored job fairs and hiring events. It also has a good selection of job openings. **You can log in to Handshake with your ASURITE UserID at career.asu.edu.**

Handouts and templates

ASU Career and Professional Development Services provides many resources to help you prepare for your job search. In addition to all the tools located on the website and Handshake, there are numerous handouts and templates available at **career.asu.edu/handouts.**

Worksheet:

List the top job requirement for a position that you have interest in pursuing. Then give an example of how you have demonstrated that skill in your current or previous position.

Skill #1:	Example of experience:
Skill #2:	Example of experience:
Skill #3:	Example of experience:
Skill #4:	Example of experience:

Sample cover letter (industry)

The cover letter is an important document in your job application packet. A tailored, one-page letter provides context and in-depth examples of your skills, knowledge and experience as they relate to the specific position you are applying for. Each cover letter you write should be specific to the position you are applying for, and should relate how you have gained specific experience in your previous jobs that is required for the new role.

It should not be more than a page, and it should not be a rehash or an overview of your resume.

It should tie the job requirements of the position to your experience and skillset. You should also use the same letterhead with your name and contact information as your resume.

Your street address
City, State Zip code

Date

Hiring Manager's Name
Transportation Resources Corporation
1234 North 1st Street Tempe, AZ 85016

Dear _____:

I am applying for the Logistics Manager position with the Transportation Resources Corporation (position #12345). I reviewed the posting for this job on ASU's Handshake and am very excited about the prospects of this position. My education and experience make me a well-qualified candidate. I am currently a full-time student at Arizona State University (ASU) in Tempe, Arizona and am scheduled to graduate in May 2011 with a Bachelor of Science in Supply Chain Management. In addition to maintaining a 3.75 cumulative GPA in a challenging academic program, I have been fortunate to participate in several supply chain and logistics research projects. In my capstone business course, I worked on a student team to evaluate the supply chain flows of corporations in the airline industry. As a team, we presented comprehensive results and recommendations to our peers and a group of Supply Chain faculty.

I have relevant experience as a Logistics Intern with bigbox.com. This internship has helped me apply my education in practical business environments. In this position, I was given responsibility for scheduling front line staff in the Tempe office. While challenging, I really enjoy the process of determining what types of resources are needed to fulfill daily shipping and receiving requirements. In the spring semester I am scheduled to present about my experience at bigbox.com to the Supply Chain Management Association student organization at ASU.

Thank you for taking the time to review my application. I look forward to hopefully meeting with you in the future to discuss your position and my qualifications. If you have any questions, please feel free to call me at 480-123-4567 or email me at myname@asu.edu.

Sincerely,

(Sign here)

Your Name

ASU Career and Professional Development Services
Arizona State University

480-965-3350
asu.edu/career
careerservices@asu.edu
@sundevilcareers

The first paragraph should state your objective and purpose for contacting the hiring manager. It should clearly state your current role and that you are highly qualified for the position that you are applying for.

The second paragraph should state your background and qualifications. Provide specific examples of how you obtained the experience required for the new position. For example, "While at XYZ Company, I led a team that developed a sustainability plan for client ABC, thus giving me key tools and experience in building relationships within the business unit to enable cooperative achievement of common goals."

This paragraph should include two to three examples of experience you have that is required for the job to which you are applying.

The third paragraph is your request for action. Briefly restate how your qualifications match the position requirements, express interest in further discussions and thank the reader for their consideration.

Include the text of the cover letter in the body of the email and attach the resume.

Sample resume (industry)

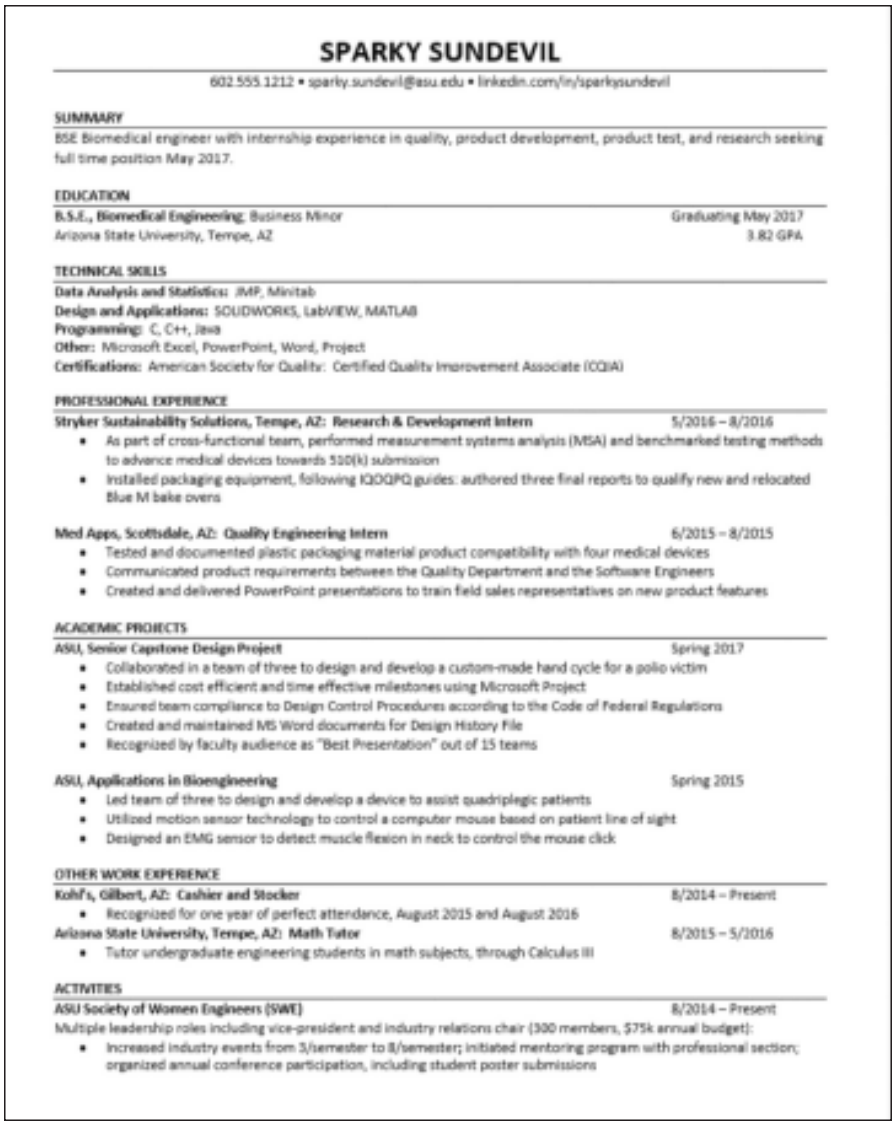
A resume should be a one- to two-page synopsis of your professional experience.

Tailor your resume to the specific job that you are applying for, taking key words and phrases directly from the job description. In most cases, employers do not want to train you — they want to know that you are ready to go on day one.

The resume is where you outline tasks and responsibilities you have had that fit the key requirements of the job for which you are applying.

Resumes should be clean, professional and easy to read.

Your name and contact information should be in the form of a header at the top of the resume. You should use this header for all your documents (cover letter, resume and references).



SPARKY SUNDEVIL

602.555.1212 • sparky.sundevil@asu.edu • linkedin.com/in/sparkysundevil

SUMMARY

BSE Biomedical engineer with internship experience in quality, product development, product test, and research seeking full time position May 2017.

EDUCATION

B.S.E., Biomedical Engineering; Business Minor — Graduating May 2017
Arizona State University, Tempe, AZ — 3.82 GPA

TECHNICAL SKILLS

Data Analysis and Statistics: JMP, Minitab
Design and Applications: SOLIDWORKS, LabVIEW, MATLAB
Programming: C, C++, Java
Other: Microsoft Excel, PowerPoint, Word, Project
Certifications: American Society for Quality: Certified Quality Improvement Associate (CQIA)

PROFESSIONAL EXPERIENCE

Stryker Sustainability Solutions, Tempe, AZ: Research & Development Intern — 5/2016 – 8/2016
- As part of cross-functional team, performed measurement systems analysis (MSA) and benchmarked testing methods to advance medical devices towards 510(k) submission
- Installed packaging equipment, following IQOQPQ guides: authored three final reports to qualify new and relocated Blue M bake ovens

Med Apps, Scottsdale, AZ: Quality Engineering Intern — 6/2015 – 8/2015
- Tested and documented plastic packaging material product compatibility with four medical devices
- Communicated product requirements between the Quality Department and the Software Engineers
- Created and delivered PowerPoint presentations to train field sales representatives on new product features

ACADEMIC PROJECTS

ASU, Senior Capstone Design Project — Spring 2017
- Collaborated in a team of three to design and develop a custom-made hand cycle for a polio victim
- Established cost efficient and time effective milestones using Microsoft Project
- Ensured team compliance to Design Control Procedures according to the Code of Federal Regulations
- Created and maintained MS Word documents for Design History File
- Recognized by faculty audience as "Best Presentation" out of 15 teams

ASU, Applications in Bioengineering — Spring 2015
- Led team of three to design and develop a device to assist quadriplegic patients
- Utilized motion sensor technology to control a computer mouse based on patient line of sight
- Designed an EMG sensor to detect muscle flexion in neck to control the mouse click

OTHER WORK EXPERIENCE

Kohl's, Gilbert, AZ: Cashier and Stocker — 8/2014 – Present
- Recognized for one year of perfect attendance, August 2015 and August 2016

Arizona State University, Tempe, AZ: Math Tutor — 8/2015 – 5/2016
- Tutor undergraduate engineering students in math subjects, through Calculus III

ACTIVITIES

ASU Society of Women Engineers (SWE) — 8/2014 – Present
Multiple leadership roles including vice-president and industry relations chair (300 members, $75k annual budget):
- Increased industry events from 3/semester to 8/semester; initiated mentoring program with professional section; organized annual conference participation, including student poster submissions

Applying for faculty and academic jobs

Putting together a job search plan

It is a good idea to put together a job search plan to give you structure and clear tasks, help you stay organized, and not get frustrated. The average time to secure an academic job, from application to start date, is 12–18 months. Many postdocs start applying for faculty jobs while completing their PhD. Even if you are in a multi-year postdoc, it is a good idea to start applying for faculty jobs starting the second year of your program As with industry jobs, you should customize cover letters and resumes to each job opening and job description. Applying for jobs can be a time-consuming process, and balancing this with your current job duties, writing for publication and lab work can be challenging.

How much time do you intend to commit to your job search on a weekly basis?

How will you search for openings?

Name five contacts you will reach out to.

1. _____

2. _____

3. _____

4. _____

5. _____

Materials for your application:

- Cover letter.
- CV.
- Research statement, writing sample or portfolio.
- Teaching statement.
- Diversity statement.
- Letters of recommendation.

Searching for openings

A few of the most popular academic job sites are listed below.

AAAS: jobs.sciencecareers.org/jobs
Academic Jobs Online: AcademicJobsOnline.org
Chronicle of Higher Education – Vitae: chroniclevitae.com
Nature: www.nature.com/naturecareers

If there are specific institutions where you would like to work, it is a good idea to check their career sites regularly.

Making contact or keeping in contact with faculty members with whom you want to work can be an effective method for learning about and acquiring jobs. Networking and attending conferences will also improve your chances of getting the job you want.

Cover letters

Your application is likely to be one of hundreds that a search committee must sort through to find the candidate they think will be the best fit for their university. The cover letter is probably the most important document in your job application packet. A tailored, one-page letter provides context and in-depth examples of your skills, knowledge, and experience as they relate to the specific position for which you are applying. Each cover letter you write should be specific to the position you are applying for, and should relate how you have gained specific experience in your previous jobs that is required for the new role. It should tie the job requirements of the position to your experience and skillset. You should also use the same letterhead with your name and contact information as your resume.

The cover letter should include these elements:

- Brief introduction.
- Statement specifying the position for which you are applying.
- Statement about your research accomplishments that indicates why the work is novel and interesting.
- Brief description of your research plans that indicates what is important or creative about your proposal.
- Brief description of your teaching experience if the job description emphasizes this.

Your materials should create an overall picture of you as a scholar. This means that you should consider each document within the context of the other materials requested. Begin by drafting longer versions of your teaching and research statements and then condensing them down. For the cover letter, take your one paragraph versions of your teaching and research statements and edit them to market yourself as a scholar and teacher. The cover letter should be able to stand alone as an independent document, with other materials supplementing and expanding on your profile in the cover letter.

Cover letter template (academic)

Date

Search Committee Chair
Department
University
Address
City, State, Zip

Dear Search Committee Members,

Introduction: This paragraph begins with you stating the position for which you are applying. Introduce yourself and share your dissertation title, chair and degree completion date.

Dissertation: Give a slightly more detailed version of your project's main findings. This can include methodology as well as a snapshot of what you examined. Follow this up with a statement about how your work extends or corrects existing scholarship. What gap in the field do you address? Provide a short overview of the dissertation trajectory that includes where you begin and where you end. If you have publications from your dissertation, mention the most impactful and relevant manuscripts.

Future research: This paragraph is about your future research, productivity and ability to earn tenure or promotion. Outline your planned future projects as they relate to your research interests, highlighting your range and focus, and how you can further complement departmental offerings. Clarify who your audience is by specifically identifying journals and presses you plan to submit projects to, as further demonstration of your research productivity. For a teaching-focused position or for shorter cover letters, you might have a single paragraph on research that covers your dissertation, publications and future research plans.

Teaching: Briefly state your approach to teaching or pedagogical orientation. Give one or two examples that demonstrate your teaching philosophy in action. These examples should not replicate the examples you use in your teaching statement. Tailor the examples to the position, thinking about the size of the classes and the topics you would be teaching in this position. Try to demonstrate similar teaching examples.

Information specific to the job ad: This is where it pays to research the department to which you are applying. Experts disagree on whether or not it is a good idea to list specific courses you can teach, or additional departments and institutes you could work with. It is important to show how your research and teaching complement current course offerings and departmental initiatives. For new and growing fields, you might find the department does not have any current course offerings or research groups related to the field they are hiring for, which is why they are hiring for the position. In that case, feel free to pitch the kinds of courses you would like to teach, including at least one lower-division course and one advanced undergraduate or graduate course, and research groups or initiatives where you could contribute.

Closing: Thank the hiring committee for their consideration and emphasize your interest in the position by giving a reason specific to the school or department. Note which materials you have included in your application and state your availability for interviews.

Sincerely,
Your name

Your CV

A **curriculum vitae** is an exhaustive list of your achievements.

Your CV should contain the following items:

- » Your name and address.
- » All higher education with degrees obtained and dates.
- » All professional positions held with dates and brief descriptions of the work performed.
- » Awards and honors, including pre- and postdoctoral fellowships.
- » Major sources of independent funding.
- » Publications.
- » Teaching experience, awards and interests.
- » References, including names titles, addresses and other contact information.
- » Invited keynotes and presentations.

In your publications lists, highlight your name and all other authors who are equal and note "*equal authorship." Do not rearrange the published order of authors. List manuscripts that are in preparation under a separate category. Do not include posters exhibited at scientific meetings.

It is easy to find examples of CVs from faculty and colleagues. Many faculty post their CVs on their departmental website or on their ResearchGate profile. At ASU, many faculty post their CVs on their iSearch directory profile.

Look up the CVs of five faculty members with whom you have worked and evaluate their CVs. Below, record your impressions of the CV, noting what you like or dislike about each.

Name	Comments/impressions
1.	
2.	
3.	
4.	
5.	

CV guidelines

General guidelines:

» One-inch margins on all four sides.
» Single-spaced.
» Consistent type size throughout (candidate's name can be 14- or 16-point font)
» Headings in bold and all caps.
» Subheadings in bold only.
» One or two blank lines before a heading.
» No italics except for journal or book titles.
» All elements left-justified.
» CV should be highly readable and well-organized.

Standard components (order varies):

1. Name
2. Address(es), phone number(s), email address(es), web site(es)
3. Education (reverse chronology)
4. Teaching Experience (reverse chronology, with inclusive dates)
5. Teaching Interests
6. Publications
    a. Books
    b. Book Chapters
    c. Peer-Reviewed Journal Articles
    d. Other Journal Articles
    e. Conference Proceedings
    f. Scholarly Web Sites
    g. Book Reviews
7. Works Submitted
8. Works in Progress
9. Conference Presentations
10. Research Experience (reverse chronology, with inclusive dates)
11. Research Interests
12. Grants
13. Service
    a. Department
    b. College
    c. Institutional
    d. Profession
    e. Community
14. Other Professional Experience (reverse chronology, with inclusive dates)
15. Honors and Awards
16. Professional Development
17. Professional Memberships
18. Language Proficiency (degree of fluency in reading, speaking, or writing)
19. References (in order of preference, with full contact information)

Sample CV

Dr. Theodore (Ted) P. Pavlic

CONTACT INFORMATION

Arizona State University
School of Computing, Informatics and Decision Systems Engineering
P.O. Box 878809, Room 553
Tempe, AZ 85287-8809 USA

Work: +1-480-965-2899
Fax: +1-480-965-2751
E-mail: tpavlic@asu.edu
www.tedpavlic.com

RESEARCH INTERESTS

Complex adaptive systems in control systems engineering and behavioral science: distributed algorithms, computational agent-based modeling, hybrid dynamic systems, decentralized decision making, emergence and self organization, amorphous computing, autonomous systems, control, communications, verification, cooperation, optimization, game theory, resource allocation, parallel computation, robotics, energy systems, sustainability in the built environment, behavioral ecology, engineering education, bio-mimicry and bio-inspiration

CURRENT ACADEMIC APPOINTMENTS

Assistant Professor, Arizona State University — August 2015 to present
School of Computing, Informatics, and Decision Systems Engineering
School of Sustainability
- Affiliations:
  - School of Life Sciences (Adjunct Professor)
  - The Biomimicry Center (Associate Director of Research)
  - ASU–Santa Fe Institute Center for Biosocial Complex Systems (ASU–SFI Fellow)
  - Barrett, the Honors College (Honors Faculty)
  - BEYOND Center for Fundamental Concepts in Science
  - Center for Social Dynamics and Complexity
  - Center for Biodiversity Outcomes
  - Global Security Initiative
  - Center for Biocomputation, Security, and Society

PREVIOUS ACADEMIC APPOINTMENTS

Associate Research Scientist, Arizona State University — August 2014 to July 2015
School of Life Sciences
- Affiliations:
  - School of Computing, Informatics, and Decision Systems Engineering
  - BEYOND Center for Fundamental Concepts in Science
  - Center for Social Dynamics and Complexity
  - Laboratories:
    - Stephen C. Pratt's Collective Behavior Laboratory
    - Autonomous Collective Systems Laboratory (PI: Spring Berman)
    - Emergence@ASU (PI: Paul C. W. Davies, co-PI: Sara I. Walker)

Postdoctoral Scholar, Arizona State University — July 2012 to August 2014
School of Life Sciences
- Supervisor: Professor Stephen C. Pratt
- Decentralized decision making and behavioral bio-mimicry of social insects

Postdoctoral Researcher, The Ohio State University — September 2010 to June 2012
Department of Computer Science and Engineering
- NSF ECCS-0931669: "Autonomous Driving in Mixed-Traffic Urban Environments"
  - Supervisor (co-PI): Professor Paolo A. G. Sivilotti
  - PI: Professor Ümit Özgüner

EDUCATION

The Ohio State University, Columbus, OH
Ph.D., Electrical and Computer Engineering, — August 2010
- Thesis Topic: Design and Analysis of Optimal Task-Processing Agents
- Candidacy: Research Problems in Distributed Control for Energy Systems
- Adviser: Professor Kevin M. Passino
- Area of Study: Control Engineering

M.S., Electrical and Computer Engineering, — August 2007
- Thesis Topic: Optimal Foraging Theory Revisited
- Adviser: Professor Kevin M. Passino
- Area of Study: Control Engineering

B.S., Electrical and Computer Engineering, June 2004
- Magna cum Laude, With Honors in Engineering
- Electrical specialization (emphasis on electromagnetics and digital computers)
- Minor in Computer and Information Systems (programming and algorithms

JOURNAL PUBLICATIONS

[1] Baudier, K., M. Ostwald, C. Grueter, F. Segers, D. Roubik, T.P. Pavlic, S.C. Pratt, and J.H. Fewell. Changing of the guard: flexible specialization and age polyethism in nest defense of the stingless bee Tetragonisca angustula. Behavioral Ecology. 2019. In press.

[2] Burchill, A., and T.P. Pavlic. Dude, Where's my Mark? Creating Robust Animal Identification Schemes Informed by Communication Theory. Animal Behaviour. 2019. Accepted.

[3] Wilson, R.S., T.P. Pavlic, R. Wheatley, A. Niehaus, O. Levy. Modelling escape success in terrestrial predator–prey interactions. Functional Ecology. 2018. In revision.

[4] Hunter, A., M.J. Angilletta Jr., T.P. Pavlic, G. Lichtwark, and R.S. Wilson. Modeling the two-dimensional accuracy of soccer kicks. Journal of Biomechanics, 72:159–166, April 27, 2018. doi:10.1016/j.jbiomech.2018.03.003

[5] Pavlic, T.P., S. Wilson, G.P. Kumar, and S. Berman. Control of stochastic boundary coverage by multi-robot systems. Journal of Dynamic Systems, Measurement, and Control [Special Issue on Stochastic Models, Control and Algorithms in Robotics], 137(3):034504, March 1, 2015. doi:10.1115/1.4028353

…

[67] Pavlic, T.P., and S.C. Pratt. The Economic Framework: Using constrained optimization to unify the ideal free distribution, the marginal value theorem, and the geometric frame- work of nutrition.

[68] Pavlic, T.P. Risk-sensitive foraging and the Sharpe ratio.

GRANTS

[1] Co-Principal Investigator, "Energy-efficient Neuromorphic Computing in Light of the Structural and Functional Evolution of Multi-scale Insect Brains", DARPA DSO, $1,000,000, April 3, 2019 to October 2, 2020.

[2] Co-Principal Investigator, "Autonomous System Control via Social Insect Models", DARPA I2O, $990,792, May 17, 2018 to August 17, 2018.

[3] Co-Principal Investigator, "Biomimicry for Sensory Communication", Google, $288,367, December 1, 2017 to July 31, 2018.

[4] Co-Principal Investigator, "CRISP: Type 2/Collaborative Research: Design and Control of Coordinated Green and Gray Water Infrastructure to Improve Resiliency in Chem- ical and Agricultural Sectors", NSF SES-1735579, $1,874,988, September 1, 2017 to August 31, 2021.

[5] Co-Principal Investigator, "A Methodology for Modeling Swarm Behavioral Dynamics from Local Observations", DARPA I2O, $175,000, June 1, 2017 to May 31, 2018

TEACHING EXPERIENCE

Arizona State University, Tempe, AZ

Instructor Fall 2015 to present
- IEE 475 (Simulating Stochastic Systems)
- SOS 212 (Systems, Dynamics, and Sustainability)
- SOS 591 (Selected Topics in Ecological Modeling)
- ANB 602/IEE 598 (Optimal Foraging Theory: From Biology to Engineering Design)

Guest Lecturer — April 2015

- ASM 394: Great Adaptations: Origins of Complexity in Nature
  - Undergraduate course in the science and mathematics of anthropology
  - Main instructor: Joan B. Silk
  - Lecture: "Connecting Evolutionary Adaptation and the Engineering Design Pro- cess"

Guest Lecturer — October 2013

- ANB 601: Research Strategies in Animal Behavior
  - Graduate-level course in animal behavior
  - Main instructor: Ronald L. Rutowski
  - Lecture: "Mathematical, Computational, and Experimental Modeling: Granularity and Parsimony"

PROFESSIONAL SERVICE

Committee Service

- Officer, IEEE Special Technical Community for Human Computation

Referee Service

- 49th Annual Conference on Decision and Control
- International Journal of Control
- ASME Journal of Dynamic Systems, Measurement, and Control
- IEEE Transactions on Signal Processing
- IEEE Transactions on Control Systems Technology
- IEEE Transactions on Cybernetics
- IEEE Transactions on Intelligent Transportation Systems
- The International Journal of Robotics Research

EXPERTISE

Mathematics:

- Applied Mathematics, Real and Complex Analysis, Measure Theory, Differential Geometry, Game Theory, Graph Theory, Combinatorics

Control Theory and Engineering:

- Linear and Nonlinear Systems Theory, Feedback, Variable Structure Systems and Sliding Modes, Distributed and Intelligent Control, Dynamic Optimization, Biomimicry, Bioinspiration, Hybrid and CyberPhysical Systems

Communications and Signal Processing:

- Probability, Random Variables, Stochastic Processes, Information Theory, Estimation, Networks

Computer Science and Engineering:

- Model Checking (automated, distributed, hybrid, probabilistic), Hybrid Automata, Software
- Verification, Component-Based Reusable Software

Natural and Social Sciences (Biology, Neuroscience, Psychology, Anthropology):

- Behavioral Ecology, Foraging Theory, Altruism, Impulsiveness, Evolution

AWARDS

National Science Foundation

- GK-12 Graduate Fellowship, 2006–2007
- Graduate Research Fellowship Honorable Mention, 2005

The Ohio State University

- Dean's Distinguished University (DDU) Graduate Fellowship, 2004–2010
- Electrical and Computer Engineering Bradshaw Scholarship, 2002–2004
- Electrical and Computer Engineering Shafstall Scholarship, 2001–2003
- University Scholarship, 1999–2003

The research statement

A research statement is a single-spaced, one- to two-page document that describes your research trajectory as a scholar, from where you began to where you want to go. This is not a research proposal like you would write for a fellowship or postdoc application. This document is where you outline what it is that you hope to accomplish with your research in the coming years. This document should reflect the type of institution to which you are applying. If the institution is research-focused, you should emphasize your publications. If the institution is more teaching-focused, then discuss how your research complements your teaching and classroom activities.

Here are a few tips to help you prepare your research statement:

- Center your name and the words "Research Statement" at the top.
- Don't tailor this document overtly to the job. This document is more about you and what you want to do.
- Do not refer to any of your other job documents.
- Stay positive — don't refer to the work of others in a negative way.
- Minimize the number of references to other scholars. Again, this is about your work.
- Articulate the core argument of your research.
- State your publishing trajectory, moving from past to present, from works in print to works in submission or preparation.
- Avoid overuse of "I" statements. (I did this, then I did this, then I did this other thing…).

Structure the statement this way:

Paragraph 1: This paragraph introduces your research topic and the interests you have for future research.

Paragraph 2: This paragraph summarizes your dissertation research. It can replicate part of your cover letter, but it should go into more detail about methods, theoretical foundations and core arguments. Think of it as a condensed version of the abstract of your dissertation.

Paragraph 3: This paragraph should describe the significance of your research within the context of your field. Discuss your publications and plans for future publication. You may need more than one paragraph for this section.

Paragraph 4: This section describes your next research project, providing a topic, methods, a theoretical orientation and a brief statement of contribution to your field. It's important to transition smoothly from your dissertation discussion to your plan for future research to give the sense of continuity and to demonstrate your expertise. It is also important that your second project is a significant expansion of your dissertation, so that it demonstrates your ability to be innovative and think broadly about future research.

Paragraph 5: In concluding your research statement, remind the reader of the broader impact of your research. What ties the projects together? What impact will you make on your field? Discuss how your work is important, and how it will impact the scholarly community and science as a whole.

The research statement should be more about your research than about you. It should not be a narrative of what you did, but a description of the science itself. You do not want to sound egotistical or self-involved. You need to demonstrate that you will be a good colleague and that you will advance the mission of the department, college and university as a whole. For teaching positions, make sure you relate how your research will relate to your teaching.

Section	Key points
Introduction	
Summary of past research	
Significance to the field	
Future research	
Summary	

The teaching statement

The teaching statement is sometimes called the statement of teaching philosophy. The document should be one to two pages, and you should strongly consider keeping it to one page. If the position for which you are applying is more teaching and less research, then you may want to expand the statement to two pages. Write the statement in first person. Focus on facts and evidence, not feelings and emotion. Explain your central approach, articulate your impact and outline specific examples of strategies, assessments and outcomes.

Consider these questions:

What are your goals for yourself? Your students?

What was your best teaching experience? Why?

What are your strengths?

What are your weaknesses?	How can you improve them?

What are your philosophies of teaching?	How do you implement them?

Teaching statement outline

Section 1

Introduction

Introduce your central teaching philosophy.
How do you approach teaching and learning in the classroom?
Provide examples of your teaching methods and strategies.
Make sure they align with your teaching philosophy.

Section 2

Teaching strategies and methods

Address how you assess student learning and
how your assessment methods fit your philosophy.

Section 3

Evidence that strategies were effective

Conclude by focusing on your students' outcomes.
What did they learn or do as a result of a class assignment?

It is easy to get passionate and preachy about teaching. Don't be afraid to write down everything you need to say, then let it "rest" for a day or so, and come back and take all the emotional stuff out. There are common traps that you should avoid.

Ask yourself these questions:

» Is it too long?

» Am I telling stories or making statements supported by evidence?

» Am I saying the same things every other teaching statement says?

» Am I excessively humble or emotional?

» Did I link my teaching to my research?

» Did I provide an evidence-based conclusion?

The diversity statement

Diversity statements are one- to two-page documents that explain experience working with people from different backgrounds. It should verify that you have an understanding that historically underrepresented and economically disadvantaged groups have confronted obstacles in their access to higher education, and that this awareness is a part of your research, teaching and service.

Consider these questions:

How have you encountered diversity in your past teaching experience?

How has this changed your approach to teaching a particular subject or topic?

What challenges are involved in a highly diverse classroom?

What strategies can you implement to manage these challenges?

Here's an outline for what a diversity statement might sound like:

Paragraph 1:
Overview – Summarize what you are going to tell them.

Paragraph 2:
Background – Explain a little bit about your background and the level of diversity you experienced in your formative years and throughout your own education.

Paragraph 3:
Introduce a project or occasion when you faced a highly diverse situation in a research project or classroom.

Paragraph 4:
Discuss the challenges you faced in that situation.

Paragraph 5:
Describe how you adjusted your actions and adapted your thinking to resolve the challenges you faced.

Paragraph 6:
Summarize how that situation and others you have faced have formed new approaches to teaching and research, how you have a heightened awareness, and how you continue to adjust your teaching to new situations and audiences.

Overview	
Background	
Introduce the example	
Specific challenges	
Adjustments made	
Ongoing and future approaches	

The academic interview

What to expect

For an academic interview, be prepared for a demanding and exhausting experience. You will be on display at all stages of the visit, from the time you arrive until the time you leave.

Your job is to:

» Convince the department that your work is exciting and that you will be a leader in your field.
» Demonstrate that you will be a good colleague.
» Determine if the institution is a good fit for you.

Why is your work exciting?
Provide evidence or examples of why and how you will be a good colleague.
What are the key elements that you are looking for in a job?

Sound like a professor

One of the challenges that first-time faculty candidates face is that they sound more like students than they do professors. The casual approach of the easy-going TA will not work in an interview setting. A tenured position is a lifelong commitment on the part of the institution, and during your interview you need to represent the person that you will eventually be as a faculty member. Be confident, but not arrogant (well, maybe be a tiny bit arrogant). Do not let your insecurities come out as you interview. Speak slowly and thoughtfully. Be aware of how you gesture and your body language. Avoid insecure verbiage like “try,” “hope” and “attempt.” Video record practice interviews, and correct annoying ticks, habits and movements.

Dress code

It is important to look the part for the job for which you are applying. Be comfortable in how you look. But remember, it is better to be over-dressed than under-dressed. Men should consider wearing a suit and tie; women should look professional, and should wear footwear that will be comfortable over the course of a long day with lots of standing and walking.

Interview questions

You can expect interview questions to fall into one of seven categories:

1. Your dissertation.
2. Your short- and long-term publishing plans.
3. Your place in the field.
4. Courses you can teach.
5. Your teaching philosophy.
6. Your interest in program building.
7. Your understanding of the financial and organizational context of the department.

Consider the following questions. Write down some brief bullet point answers for each.

» How is your dissertation different from other work in your field?

» Who are the biggest scholarly influences on your work?

» What are your publication plans arising from your dissertation?

» What is your research program for the next five years?

» What are your immediate and long-term publication plans?

Interview questions (continued)

» How would you teach a large intro course in your discipline? What text would you use? What would the assignments look like?

» Name two specialty courses you would like to teach — one undergraduate and one graduate:

» What inspires your teaching?

» What do you think is an important intellectual debate currently taking place in your field?

» Many schools have high expectations for publishing as a requirement for tenure. How will you incorporate writing into your routine?

» Do you plan to apply for major grants? Which ones?

The job talk

The job talk is typically an hour-long presentation of your current research. Write out the entire talk with your audience in mind. This is not a presentation of a scientific paper. The audience will be university faculty, staff and students from a variety of fields and disciplines. The talk needs to be compelling to people who do and do not have familiarity with your field.

Here are some tips for preparing your job talk:

Make sure your job talk relates to the job for which you are applying. Doing a job talk unrelated to the position vacancy will hurt your chances of being selected.

Write out the entire talk ahead of time. You need to demonstrate that you can adapt to your audience and give a clear and compelling presentation. Your audience represents the vast and diverse pool of undergrads that you will be responsible for educating if you are selected for the job.

Present the talk in front of a mirror. Time it. It is better to be a little too short than to be excessively long. Once you have a sense for how much you can cover in 45 or 50 minutes, develop a set of presentation slides to emphasize your content. Use images and diagrams. Avoid excessive text on your slides. As you practice and become more comfortable with what you plan to say, remove more and more text from the slides. You do not want your audience trying to read the slides and listen to you at the same time.

After some general background, get to the point and stay on point. Do not try to cover multiple projects in one job talk — it will be incoherent and could imply desperation. Make a clear and logical argument. Be formal and professional. Avoid casual references and slang. Be cautious of attempts at humor. Have a strong conclusion and an inspiring finish.

Practice. Practice by yourself and in front of an audience. Get their feedback.

The chalk talk

The chalk talk is a more informal presentation used to test how you think on your feet. This is typically a discussion about your future research. It should feel informal, but it will require careful preparation.

- Give a very brief review of your past and current research.
- Include short- and long-term objectives.
- Identify several specific problems you want to work on, and explain in detail how you will proceed.
- Be prepared to work on a whiteboard.
- Make sure you have some preliminary data that demonstrates the feasibility of your plan.
- Convey why the work is important
- Be prepared to be interrupted and to engage in discussion, but don't let the discussion throw you off track.
- Make sure your conclusion is strong and gives them the sense that you will be a thoughtful and engaging colleague.

Post-interview thank-you letter

Immediately after you return from your visit, send the chair of the committee a thoughtful, formal letter of appreciation.

Entrepreneurship

Postdocs make good entrepreneurs

Many people agree that postdocs are great candidates to form startups.
You know how to do research. Successful technology companies are based on great scientific research, but they are also made up of founders who have done their research on the market. We call this "customer discovery," and it's about talking to potential customers and asking them to describe the problem you are trying to solve, in their own words. This allows you to make a sound judgement call based on a lot of these interviews, to determine what the customer archetype looks like, and decide whether or not you should start the business.

There are other advantages to starting a company while you are a postdoc:

- You work hard. You're passionate. You work 60, 70, 80 hours a week. Entrepreneurs do this, too.
- Your postdoc salary helps you bootstrap. This means entrepreneurs usually work a day job while they work on starting the business. As a postdoc, you have a built-in day job that parallels your startup idea.
- You're coachable. You might not know a lot about business, which means we can connect you with mentors and teach you the business side.

In the following pages, you'll work through a series of questions and exercises that can help you determine whether your research might be a good fit for a startup company.

Describe your research in less than 100 words:

What is the problem you are trying to solve? (25 words or less)

Who has the problem?

Describe what you think the potential solution might be.

Complete the following sentence, as if you already have the solution.

We provide _____

to _____

who need _____.

This is a value proposition statement. The first blank is your solution, the second blank is your customer (the person or group of people who have the problem) and the third blank is the problem you are trying to solve. If you are able to complete this sentence, you may have the beginnings of a startup company!

Intellectual property

What is IP?

There are many definitions of intellectual property. The Stanford Encyclopedia of Philosophy defines IP as "non-physical property that is the product of original thought." Other sources define it as "creations of the mind, which have a moral and a commercial value." IP can be inventions, literary and artistic works, and symbols, names, images, and designs used in commerce.

As employees of the university, your research is owned by the university as part of your employment contract. This is true for nearly all universities and companies who hire employees or contractors. If you have a research discovery that you wish to commercialize for personal financial gain, you can do so, but you must have a legal contract with the university that allows you to do this. This contract is called a license agreement. Because you were under a paid contract to develop this research, the university will want a portion of the proceeds that you gain from its commercialization. This is usually done in the form of a royalty on revenue, and partial ownership (stock) in the company. This is also standard for nearly all universities.

Some people consider this unfair, but keep in mind that the university paid them a salary; provided insurance and health care; provided buildings, equipment, and electricity to do the research; and provided job security that allowed the invention to take place. The university also pays the up-front costs to file provisional patents, as well as the full costs and fees required to maintain the patents with the U.S. Patent and Trademark Office (USPTO). These costs are often tens of thousands of dollars, and can even reach hundreds of thousands of dollars.

There are four common kinds of IP:

- » Patents.
- » Trademarks.
- » Copyrights.
- » Trade secrets.

Universities will protect research and inventions using all four forms of IP.

Patents

Patents are the most common and most expensive of the forms of IP. There are two kinds of patents: utility patents and design patents. What this means is that you can protect your design of how something works, and you can protect the design of how something looks.

A good example of this is the Lego® brick system. Lego® patented the bricks for how they work (how they interlock together) and for how they look (the design).

Patents are good for 20 years from the date the patent was submitted for consideration to the USPTO for protection. It can take three to five years for a patent to get issued. This time is included as part of the 20 years. Companies can continue to utilize the product or invention while they wait for the patent to be issued.

Patents have inventors, owners and assignees. In a university, the professor and their team are usually the inventors, the university is the owner, and the assignee can be anyone who has a license agreement to use the technology.

Trademarks

Trademarks are a recognizable sign, design or expression which identifies products or services from a particular source. Trademarks are often the logo that the company uses to identify itself. The trademark can be classified as a "TM" or as a ®. The ® stands for "registered" and applies to the entire United States, and it can be filed to cover additional countries as well. The "TM" is referred to as the "common law" trademark, and can be used without registering the image with the USPTO. It is less expensive, but also provides less protection.

Copyrights

A copyright is a legal right that grants the creator of an original work exclusive rights for its use and distribution. Things that can be copyrighted are literary works, motion pictures, musical compositions, sound recordings, paintings and drawings, sculptures, photographs, computer software, radio and television broadcasts and industrial designs. A copyright usually expires a certain amount of time after the death of the author, usually 50 to 100 years.

Trade secrets

A trade secret is defined as a formula, practice, process, design, instrument, pattern, commercial method or compilation of information not generally known or reasonably ascertainable by others, by which a business can obtain an economic advantage over competitors or customers. Because a trade secret is a secret, there is no expiration. The company is responsible for protecting the secret and making sure competitors cannot replicate it.

What to do if you think an element of your research can be protected:

As part of your employment contract, you are required to disclose any technology or invention that you believe may be able to be protected under one of the above methods. ASU's office of intellectual property is SkySong Innovations.

More information is available on the Skysong Innovations website at **skysonginnovations.com/inventors.**

Public disclosures

One word of warning: if you make a public disclosure of the intellectual property, that will nullify the ability of the university to patent that technology.

This means if you publish a paper or give a presentation that reveals the technology, method or design that you have created, you will not be able to apply for a patent.

It is very important that if you think you have something that may be patentable, complete the ASU Invention Disclosure Form well in advance of any presentation or publication you intend to give. This will give the technology transfer office time to file a provisional patent application that will protect you and allow you to present your technology without losing the ability to patent it.

The invention disclosure form is online at **skysonginnovations.com/submit-innovation.**

Customer discovery

The customer knows best

How do you know if your technology can be commercialized? The best way to find out is to talk to customers. You may think your technology is the greatest thing ever created, but if it doesn't fit the need or want of the customer, it will be a disastrous failure.

It really is as simple as talking to customers. By using the Lean Launchpad process, we can help you with some steps and guiding principles to make sure you are asking the right questions.

First, let's figure out who to talk to.

In the box to the right, list all of the **people** who might be able to use your technology. These should be people who have a role in an organization: cancer patient, lab scientist, medical doctor, research chemist, etc.

Your customer segments should resemble the title on someone's business card. They should be as specific as possible. List as many as you can.

Next, using your network, contacts from your advisor, and LinkedIn and other online resources, reach out to individuals who you might be able to gain insight from. **Here is an email template:**

Hello _____,

I am a postdoc at Arizona State University, and I'm doing research for a project.
I understand that you are an expert in the area of _____.
Would it be possible to meet with you for a few minutes and learn more about your work? It would be very useful for my project.

Best regards,

_____

Customer segments

When you meet with the interviewee, it is very important to ask questions that will inform you about how severe the problem is that you are trying to solve. **Your questions should follow this format:**

1. I understand you have a problem with _____.
   Is this true? Please tell me about this issue.
2. How severe is the problem?
3. What have you done to try to solve this problem?
4. How much time and money does this problem cost you per year?
5. Who else has this problem that I might be able to talk to?

By asking open-ended questions, you can gain valuable insight about whether or not the problem is costly enough to make it worth building a company around the solution. You should talk to at least 20 potential customers at this stage of the process.

Defining your value propositions

What is the gift you give your customer? That is your value proposition. You solve a problem that no one else has been able to solve. In the previous exercise, we explored who has the problem. Now you can look at the customer segments to determine what the value propositions are.

Take each one of your customer segments, and determine what your solution does for that specific customer.

We provide _____ to medical doctors.
We provide _____ to cancer patients.
We provide _____ to research chemists.

These "blanks" go in the value propositions box to the right.

Now take it one step further — try to add numbers to your value propositions.

How much time can you save the customer?
How much better can you diagnose a disease?
How much money can be saved by using your technology?

Really try to drill down and be as specific as you can. These value propositions are the reason **why they buy** your product or service. Be thoughtful and creative.

These value proposition statements become your hypotheses.

"We believe medical doctors will want to save 15 minutes per procedure."
"We believe cancer patients will want to reduce chemotherapy treatments by 50 percent."
"We believe research chemists will want 80 percent better accuracy when testing compounds."

Value propositions

These are your hypotheses; now you need to go out and test them. Go interview 20 more people who fit the descriptions of your customer segments, and ask them what kind of results they will need to see in order to change their behaviors to a new method or technology.

The Business Model Canvas

On the following pages, you'll find a chart that is called the Business Model Canvas. The BMC is a roadmap to help you build a business plan. Use the prompts on the canvas to help you fill in your hypothesis for each box. Don't worry about accuracy. All of these are guesses that you will need to go out and test.

To learn more about the BMC, visit **strategyzer.com**

The Business Model Canvas

Key partners

People outside your company that you depend on for supplies, products or services.

Key activities

Things that your company needs to do on a daily or weekly basis.

Key resources

Things inside and outside your company that you depend on in order to produce your product or service.

Cost structure

Things that you pay for to produce your product or service.

Value propositions

Customer relationships

How you keep and grow the customers you already have.

Channels

How you deliver your message and communicate with customers.

Revenue streams

How you make money.

Customer segments

Forming a company

Filing for an LLC in Arizona

Whether you are thinking of starting a tech company based on your research, or you just want to do a little consulting as your side hustle, it's best to do that with a separate company.

Be advised: this guidebook is written for the purpose of giving you an idea of the steps it takes to set up a company. Setting up a company is a legal act and you should **consult an attorney** before taking any of the following steps.

Usually, an LLC is the easiest and fastest way to set up a business. The first stop is going to the Arizona Corporation Commission website and doing a name search. This is simply a search to make sure there isn't another business in the state of Arizona that has the same name as the one you want to use for your business.

Start Start at the **Arizona Corporation Commission**'s webpage: **www.azcc.gov.**

Select Select **Search Corporations and LLCs.**

Search Enter the name that you would like to use for your company in the **Entity Name** box and click **Search.** This will return a list of companies in the state with similar names.

It's also important that you consider a website domain name at this stage. You may want a web domain that is the same or similar to your company name, so checking the availability of both at this time is wise.

If you are ready to register your new company, return to the AZCC homepage and click **Start a New Corporation or LLC**. This page lists 10 steps for starting a business in Arizona. Read them carefully and follow these directions.

To register your company, select the **eCorp** button on the header of the web-page, create an account, and then select **My Dashboard**, and create a new LLC.

Here are some tips to help you:

Your **statutory agent** it the person in charge of your company's legal matters. This is probably you, for the time being. Or it could be another company, an attorney or a law firm. Unless you have a law firm already representing you, go ahead and enter yourself as the statutory agent. You'll also need to enter your home address as your known place of business.

You'll need to select your **management structure**. Most companies select "manager-managed." This means you or a representative of the company is authorized to make legal decisions for the company. "Member-managed" means that all members of the LLC are required to authorize any legal decisions for the company. Usually, for convenience, most LLCs are manager-managed.

You'll be required to enter the **principal members** of the LLC. This is you and any **partners** that are part owners in the LLC.

Then, you are required to enter the **organizer**'s information. This is also you.

Finally, you **sign** the form and click **add** and, of course, **pay** your $50, or $85 for expedited processing.

The next project is for you to establish an **operating agreement** — especially if you have partners in the LLC. Without an operating agreement, the state will assume that all partners in the LLC have an equal amount of ownership in the company. It is very important that you do your research on operating agreements and get one established as soon as possible. It is recommended that you do this with the help of an attorney. This can get quite expensive, so you may want to carefully consider a number of potential attorneys before selecting one.

Licensing IP

If you have an interest in forming a startup company to commercialize an aspect of your research, visit **skysonginnovations.com/inventors.**

Other entrepreneurial resources

ASU Office of Entrepreneurship + Innovation: **entrepreneurship.asu.edu**
VentureWell: **venturewell.org**
Steve Blank: **steveblank.com**
How to Build a Startup video series: **udacity.com/course/how-to-build-a-startup--ep245**
NSF Innovation Corps: **nsf.gov/news/special_reports/i-corps**
The Ewing Marion Kauffman Foundation: **kauffman.org/what-we-do/entrepreneurship**
Techstars: **techstars.com**
Strategyzer: **strategyzer.com**
Y-Combinator: **ycombinator.com**
#yesPHX: **yesphx.com**

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Institutes:

ASU Career and Professional Development Services

Burroughs Wellcome Fund and Howard Hughes Medical Institute — "Making the Right Moves"

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Stanford University Office of Student Affairs

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UCLA Career Preparation Toolkit

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