Academic and Non-Academic Career Paths and Job Search

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What to Expect?
Research, Teaching and Service

Research
engage in scientific discovery, support graduate and undergraduate students, funded research

Teaching
active teaching, mentoring, advising

Administration/Service
Chair, serve-on committees, etc.
- Departmental
- School /College
- University
- Professional: societies, conferences, journals
# Types of Colleges/Universities

## Private vs. Public

<table>
<thead>
<tr>
<th>Type</th>
<th>Degree Program</th>
<th>Emphasize</th>
<th>Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Universities</td>
<td>Ph.D.</td>
<td>Research</td>
<td>Teaching &amp; Service</td>
</tr>
<tr>
<td>Colleges / universities</td>
<td>M.S.</td>
<td>Teaching</td>
<td>Research &amp; Service</td>
</tr>
<tr>
<td>Selective Liberal Arts Colleges</td>
<td>B.S.</td>
<td>Teaching &amp; Scholarship</td>
<td>Service &amp; Research</td>
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<tr>
<td>Undergrad oriented</td>
<td>B.S.</td>
<td>Teaching &amp; Service</td>
<td>Research</td>
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</table>
Example of Different Expectations Faculty

Research Institution:
60% - 80% Research
10% - 35% Teaching
5% - 10% Service

M.S./ B.S. College or Teaching focused at R1:
50 - 80% Teaching
10 - 30% Professional Development
10 - 20% Service
Different Academic Positions within an Institution and Expectations

Professorial Ranks
Assistant
Associate
Full
Distinguished/Chaired/Endowed Professor

Instructor – teaching & service
Lecturer - teaching
Postdoctoral positions - research
Research Expectations: Research University

- Publications – journal, conferences, workshops (focus on top peer-reviewed venues)
- Funding to support research group and summer salary (peer-reviewed, basic vs applied, grant vs contract)
- Graduate student training (and their professional success)
- Reputation and Impact
  - Higher in rank: more visibility and international reputation – talks, invited talks, involved in conferences, major review boards, NRC panels etc.
- Maybe:
  - Undergraduate research mentoring
  - Patents, software artifacts,...
Teaching: Research University

- Teaching load: typically 1:1 to 1:2
- Mix of undergrad and grad courses
- Course material: intro undergrad up through core grad course, seminar in research area.
- Teaching assistants for grading, office hours, and overall help

- Good research but bad teacher – harder to be promoted.
- Good teacher but bad researcher – impossible.
- Good researcher, fair teacher easier to be promoted than good teacher, fair researcher
Service Expectations: Research University

- Department committees
- University committees
- External Professional Service
  - Program committees
  - Funding panels
  - Professional society involvement
  - Journal editorship; program chair, conference organization

- Higher in rank, more external service
- Pre-tenure: Favor research-oriented service
- Be selective: choose roles that are important where you can engage
Life as a professor at a research university

Pros:

• Freedom for research (within bounds)
• Work on the frontier of computer science, biology, engineering, social sciences, cognition....
• Get to develop your ideas and vision
• Get to teach/inspire/lead/mentor the next generation.

Cons:

• Must find funding for students/projects
• Must judiciously choose balance of research/teaching and work/life
Some advice: What you can do right now to start preparing

Research
• **Read broadly, attend talks**: How does your research fit into a bigger vision? Trends?
• **Always on the lookout**: Keep a list of potential future research ideas.
• **Publish!**
• **Cultivate your professional network**: Seminars, conferences, mentors, ...
• **Communication skills matter**: Writing, speaking!

Teaching
• **View TA as prep. Ask for chance to lecture.**

General
• **Make your own best opportunities**: Ideas? Opportunities? Awards? Fellowships? **ASK!!**
Some advice: pre-tenure years

- Find mentors and professional cohorts.
- Seek feedback.
- Know your strengths.
- Do what you find easy for all else collaborate.
- Learn to say no.
- Prioritize!! Especially in research.
- Write well.
- Choose your teaching service carefully
  - !Have fun!!
On Job Stress

Common Quote: “I chose career path X because I heard career path Y would be too stressful.”

To consider: Any job is stressful if the job’s expectations do not align with the resources available, OR if its priorities do not match your strengths/loves.
Teaching Position
What types are out there?

- Teaching at small college
  - Professor (assistant, associate, full) with tenure
  - Lecturer

- Teaching track at Research University
  - Many different types/titles
  - Teaching Professor
    - Professor of the Practice, Clinical Professor, Lecturers with SOE (CA)
    - Few with tenure, most on contracts
  - Lecturer, Senior Lecturer
Teaching Position Expectations

- Teach 2-4 classes per semester
- Have busy office hours
- Teach out of your specific area (e.g. intro programming sequence, non-majors)
- Involve undergrads in research projects
- Attend meetings (dept., campus)
- Serve on campus committees (technology, etc.)
Teaching Position

Research

- Fewer institutional resources
- No graduate RAs
- Get undergraduates involved
  - Distributed Research Experience for Undergraduates
  - Collaborative Research Experience for Undergraduates
  - REU through NSF
  - Local programs at undergraduate institution
Teaching Position

Getting Hired/Cover Letter Essentials

- Your focus is on teaching.
- You can document relevant experience related to teaching.
  - Teaching Assistant
  - Center for Teaching programs
  - Instructor of Record for a course
- You can teach intro CS courses and courses for non-majors.
- Your teaching focus (e.g., systems) matches what is advertised.
Teaching Position: Challenges

- Perception that less prestigious than research focused/university
- Intense focus on students
- Staying engaged in research
- Infrastructure (e.g., computer services, grant administration)
- Small dept. (~5 profs) or small group in a large research department
- Salary: possibly lower?
Teaching Position: Rewards

Close relationship with undergrads
Be a member of the university culture
Chance for leadership and influence
Matches beliefs/lifestyle

  Teaching is your gift and you want to share it with others
  Possibly less travel
  Flexible schedule for families
Post-Docs

Transitional period into another career path
  Teaching post-docs & research post-docs both available

Funding
  Fellowship you apply for, OR university/department, OR professor’s research grants.

Best-case Scenario
  2 years, good mentor, high-ranked school that will help you transition to long-term job of your dreams.
Career Path Option
What is a post-doc?

Training opportunity whereby a person can deepen his or her expertise and/or research skills for a few years, en route to a permanent position.

Typically funded either by a fellowship awarded directly to the Post-Doc or by the institution at which they will spend a limited time.
Some Post-doc Motivations

Timing: Graduate “off season”, Two-body issues, Difficult job year

Improve job opportunities: Strengthen research, Work in a highly regarded institution

Learn new area, field

Work with a specific expert: additional mentoring

Experience different type of university
What is a GOOD postdoc?

Used to expand experience
  entering a new research discipline
  gaining a distinctly different perspective on the scholar’s current research base

Specific & relevant intellectual growth
  working with a particular mentor or on a particular project

Two years in duration
GOOD postdoc position offers:

Mentoring & guidance that directly supports professional development
  not simply serve as a contract researcher

Significant opportunities to explore independent research topics
  in addition to supporting existing research efforts of the mentor’s group
  manage operational aspects of a project under the supervision of the mentor

Enhance the breadth of their research
  exploring new fields or new perspectives
  not simply refine material from PhD
Expectations

Variable, some combination of:

Teaching, Research, Supervising, Mentoring, Organizing

The ratio will depend on your own long-term goals, and the position

Should get a clear understanding BEFORE accepting job
Challenges

Low pay (compared to faculty, industry)

Role in the university
   Not a student, but not faculty
   Depending on school, can feel isolated

May not have independence
   working on PI’s grant

If you have family, can be difficult to move for a temp position
Research Scientist

No tenure
  “Soft money” – grant writing!
Less requirements (service, teaching)
  Can focus on research
Dependent on PI
  Hired to get things done for grant
  Not independent
  Need a good advocate, well-funded lab
Possibly easier work/life balance
Job Search –
Closer to getting out

Prepare CV and research/teaching statements
Get these materials reviewed
Talk to advisor/other faculty about where to apply
Apply to several places
Prepare/Practice interview talk
Be assertive
How to get a post-doc

Can be posted in same venues as other academic jobs
Not always advertised
Use Your Network!
Give talks as you get closer to graduating
Remain in PhD lab
Usually for timing reasons only
Moving between schools and positions

University to university
Not particularly difficult
If have tenure, usually get tenure
• But not in all cases: schools have different rules and moving to higher ranked school

University to teaching-oriented college
Must show evidence of being good teacher

Teaching-oriented College to university
Must show can do research - publications
## Industry to Academia Comparison

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<th>Academia</th>
<th>Industry</th>
<th>National Lab</th>
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<tr>
<td>Active publishing in top tier conferences</td>
<td>Must build “real” systems</td>
<td>Mix of building “real” systems and publishing</td>
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<tr>
<td>Active collaborations with academia</td>
<td>Up-to-date technical skills</td>
<td>Active collaborations with labs and academia</td>
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<tr>
<td>Establish visibility in research community</td>
<td>Understand business roadmaps</td>
<td>Address agency mission critical problems</td>
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<tr>
<td>“Soft” money</td>
<td>“Hard” money</td>
<td>“Soft” and “hard” money</td>
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# Engineer or Researcher

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<th>Researcher</th>
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<tr>
<td><strong>Deep technical expertise:</strong> design, coding, testing, analysis</td>
<td><strong>Proactive leader for innovation</strong> (applied research)</td>
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<tr>
<td><strong>IP:</strong> patents &amp; papers</td>
<td><strong>IP:</strong> foundational inventions</td>
</tr>
<tr>
<td><strong>Employer’s bottom line:</strong></td>
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</tr>
<tr>
<td>• Supports the sales process and ongoing customer satisfaction</td>
<td>• Bolder stance (higher risk)</td>
</tr>
<tr>
<td>• Proactively pleases customers</td>
<td>• Seeks productive partnerships with other business units and external collaborators</td>
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Becoming a Technical Leader

• Act like one: Show initiative & vision.
• Be trustworthy
  • Follow through on commitments in a timely fashion.
  • Treat people fairly and with respect.
• Demonstrate ability to work with others
• Let people know you are interested
• Work to acquire qualifications
• Find a mentor to help
Backup Questions

• Do internships matter?
• Can I publish papers?
• How do you find and get on projects?
• What is the interview process like?
• How important is teamwork versus individual work in your environment?
• What is the career path of a researcher in your organization?
• Is it possible to switch during your career: Industry/Academia/National Laboratory/Funding Agency/Non-Profit?