Academic Life
Before and After PhD

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Industry vs. Academia?

- **Industry: a few options**
  - **Startup**
    - **Pros:** gratification in tech development, potentially large $$$
    - **Cons:** potentially very small professional network, long hours
  - **Large company**
    - **Pros:** not as much work as startup
    - **Cons:** little freedom for your own ideas
  - **Research lab**
    - **Pros:** you can still do research
    - **Cons:** potentially non-existent, limited growth potential

- **Academia: single option (if you are going for research)**
  - **Pros:** develop ideas with bright young people, very large professional network (constant flow of ideas)
  - **Cons:** long hours, lots of travel, lots of bureaucracy

If You Decide for Academia, Plan Ahead

◆ **Industry**

– Few weeks in advance should be sufficient
  (unless starting up yourself)

◆ **Academia**

– Plan at least a year in advance

  ● Make sure you have enough publications (at right places)
  ● Maybe give a seminar at few schools of interest
  ● Talk to people (your advisor can help you) about positions
  ● Watch for job announcements (sometime in Fall)
  ● Prepare and submit your application (sometime in Dec / Jan)

Preparation: Make a List of Schools

- **How many places to apply to?**
  - Too many not good (you will be exhausted)
  - Too few not good (you may not get a job)
  - About 4-8 is a good ballpark (pick carefully)

- **Several types of places to consider**
  - Favorites: definitely go if offered a job
  - Maybes: consider going if offered a job
  - Networking: practice your talk and meet people

- **Know everything about places you plan to apply to**

Some Results of My Research: Research Publications in ICs (2000-2005)

Digital (Analog)	Rank	ISSCC	VLSI	CICC	ESSCIRC	JSSC
Stanford	2	18 (13)	14 (5)	4 (6)	3 (1)	13 (21)
MIT	1	7 (5)	4 (3)	4 (3)	3 (0)	11 (13)
Berkeley	3	8 (8)	1 (2)	2 (11)	3 (4)	9 (9)
Caltech	6	0 (5)	0 (2)	0 (10)	0 (2)	0 (9)
Michigan	5	0 (2)	0 (1)	3 (2)	1 (0)	2 (2)
UIUC	4	1 (1)	5 (0)	4 (0)	1 (1)	4 (7)
UCLA	13	7 (20)	5 (9)	11 (17)	3 (0)	13 (37)
UCSD	16	2 (9)	0 (0)	3 (9)	1 (0)	4 (6)
Columbia	26	2 (3)	2 (1)	1 (2)	1 (0)	2 (6)
Harvard	30+	3 (1)	1 (0)	0 (0)	1 (0)	0 (2)
Cornell	8	2 (1)	0 (0)	0 (0)	1 (0)	0 (2)
USC	14	0 (2)	0 (0)	4 (0)	2 (0)	0 (0)

Some More Results of My Research:
Full-time Faculty (EE & CS, UCLA: EE only)

Faculty	Total	Own (%)	Stanford	Berkeley	MIT	Big 3
Stanford	61	20 (33%)	(20)	13	7	66%
MIT	102	43 (42%)	17	15	(43)	74%
Berkeley	82	17 (21%)	10	(17)	14	50%
Caltech	17	2 (12%)	4	6	1	65%
Michigan	117	13 (11%)	9	10	11	26%
UIUC	97	5 (5%)	4	11	13	29%
UCLA (EE)	46	6 (13%)	7	6	2	33%
UCSD	52	3 (6%)	3	7	3	25%
Columbia	25	4 (16%)	2	4	4	40%
(Harvard)*	* did not collect data					
(Cornell)*						
USC	69	9 (13%)	8	5	6	28%

Planning an Interview

- **Schedule your interviews wisely**
  - Avoid going to top places first
  - Leave enough margin to compare offers

- **Before you hit the road, remember:**
  - You are representing not just yourself
  - Also your Ph.D. advisor
  - Your Ph.D. program
  - Your research area
  - And your university

Prepare for 1-on-1 Interviews

◆ **Ask for the schedule of your visit a few days in advance**

◆ **Read papers from each person on your schedule**
  – Pay special attention to people outside your area
  – At least 3-5 papers to get an idea of their work
  – Get a broader understanding of the department

◆ **Have multiple talks ready**
  – Elevator pitch: 30-second version (for a quick chat)
  – A 5-min version (for 1-1 interviews / people who miss your talk)
  – A 10-min version (dept. head, dean)
  – A 45-min version (actual job talk)

The Structure of a Job Talk

◆ **General ground rules**
  – Do not make 50+ slides (there is no time!)
  – Avoid flashy animations / too many colors etc.

◆ **Good job talk is unfortunately not the best talk you can give**
  – Not everyone will understand it, not purely technical
    (like a good conference talk)
  – Couple elements of a good job talk
    (never forget the big picture)
    ● Part 1: You must excite everyone in the first 5-6 slides
    ● Part 2a: Start dwelling into details, but keep most of the audience
    ● Part 2b: Briefly drill down low enough to even loose/amuse the experts
    ● Part 3: Show results and explain what is new and significant
    ● Part 4: Close with few slides about your future plans
  – Demonstrate your ability to identify and solve problems

Typical Two-day Interview Schedule

- **Arrive the night before**

- **Day 1**
  - Breakfast
  - 1-on-1's (30 minutes)
  - Job Talk
  - Lunch
  - 1-on-1's
  - Dinner
  - Collapse

- **Somewhere in there**
  - Department tour (offices, labs, etc.)
  - Talk with Dept. Chair and Dean
  - 15-30 mins to gather your thoughts, go to bathroom
  - Go over your notes (before you go to bed)

- **Day 2**
  - Repeat day 1 minus talk and dinner

What Departments Look for in New Faculty

- **Overall promise**
  - Are you smart, clever problem solver?
  - Are you full of ideas, an innovator, a visionary?
- **General teaching ability**
  - Can you teach, what can you teach?
  - Ability to teach courses in need of staffing
- **Ability to do research in specific areas**
  - Are you an independent thinker?
  - Are you an incrementalist, an integrator?
  - Are you a clone of your advisor?
- **Compatibility with department and institution**
  - Do you complement interests of current faculty/research staff?
  - Do you fill a hole or overlap? Does your personality mesh well?
- **Potential for securing external funding**

What Departments Look for in New Faculty

◆ **Articulate**
  – How well do you express yourself orally and in writing?
◆ **Energy**
  – Are you a go-getter?
  – Will you make things happen?
◆ **Leadership**
  – Will you start new initiatives?
  – Will you inspire those around you?
◆ **Are you a superstar?**
  – NSF CAREER Award material?
  – ACM Dissertation Award material?

What You Should Look For

- **Research**
  - Any interesting research going on there? Can you imagine doing the kind of research you like to do there? Someone with whom you can have a deep technical talk?
- **Colleagues**
  - Number and quality. How good is their best? Are you smarter than all of them? Do you like the people? A potential buddy?
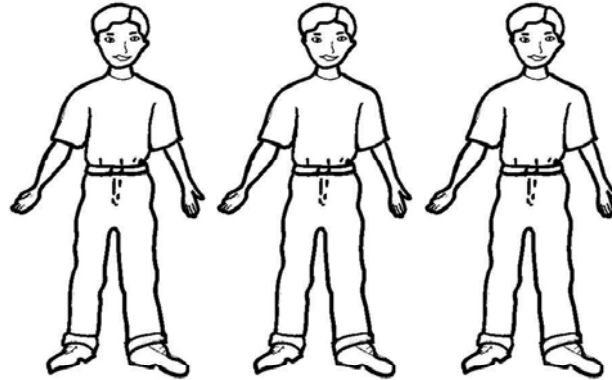- **Students**
  - Number and quality. How good is their best? Are you smarter than all of them? Mostly foreign or domestic? Where did their grad students get their u-grad degrees from? Where their graduates go? Industry? Academia? (top schools?)
- **Teaching**
  - Courses you'd enjoy teaching? Flexibility in choosing courses? Teaching load OK? Flexible? Can you "buy out" of teaching?
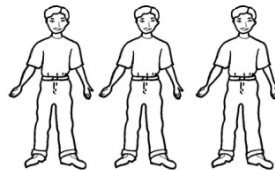
Relative Power Positions
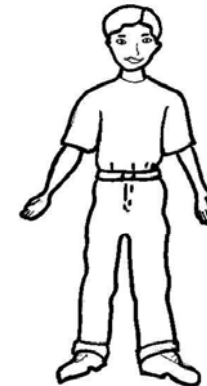
Before job offer

Hiring committee   **_Applicant_**

After job offer

Hiring committee   **_Applicant_**

Negotiating the Offer

- **Equipment**
  - Check what's available (people are typically willing to share)
  - Check for availability of software and licenses
  - Check for access to chip fabs
- **Students**
  - More/less standard school-specific packages
- **Space**
  - Make sure you have adequate space for lab and students
- **Salary**
  - Not polite to negotiate, do it with places that low-ball you
  - Negotiate the highest starting salary, % increases afterwards
- **Housing**
  - Temporary accommodation, housing allowance

First Weeks/Months/Years at a Job

◆ **Academic life = "If I can just find the time"**

- – Research (not one project – many)
- – Teaching (do it the best you can, but won't help your tenure)
- – Service (departments "protect" junior faculty from serving)
- – Funding (write proposals, success rates ~10%)
- – Publishing (journals, conferences, books)
- – Program committees (conference, editorial, etc.)
- – Travel (research reviews, service activities, fundraising)

The Time Management Matrix

	URGENT	*NOT URGENT*
IMPORTANT	• pressing problems • deadline-driven work (projects, meetings, …)	• planning • preparation • true recreation
UNIMPORTANT	• Interruptions • Some phone calls • Some meetings	• Trivia, busy work • Some phone calls • "Escape" activities • Irrelevant email, TV

How to Pick Good Students

- **Interview students (after you review the apps)**
  - 1: Make phone calls to top 12-15 people (~50% pass this stage)
  - 2: Follow-up email to solve a problem with bounded time (~50% passing rate)
  - 3: Make 3-4 offers for about 2 students
  - 4: Leave a slot for exceptional students you later discover in class

- **Prepare students for a smooth transition**
  - Assign some readings during the summer before they come
  - Connect them with peers for any tips / advice they need coming in

Running Your Own Research

- **It is fun!**
  - You enjoy every moment of the little time you have to actually do it (between proposals, travel, writing papers, reviewing papers, making research reports, teaching, service, infrastructure setup, department meetings, seminars, …)

- **Some good reasons to do research**
  - To educate future technology developers
  - To develop new technologies ("incremental" work is not fun)

If I Could Just Find the Time...

◆ **I would have possibly made some more slides**

◆ **Nevertheless, I hope these give you some idea of what it's like to decide, prepare, and start an academic career...**

◆ **Good luck!**

References

- Richard M. Reis, *Tomorrow's Professor: Preparing For Academic Careers in Science and Engineering*, IEEE Press, New York, NY (1997)

- *Making the Right Moves: A Practical Guide to Scientific Management for Postdocs and New Faculty*, Burroughs Wellcome Fund, Howard Hughes Medical Institute (2004)
  - Based on the BWF-HHMI course in Scientific Management for the Beginning Academic Investigator

- Jeannette M. Wing, *Tips on the Interview Process*, (2005)
  - Google it up