



Interacting With Industry

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Outline

- Choosing between Academia & Industry
- Collaborating with Industry
- General Research Advice



Kinds of “Industry”

- Industrial Research
- Product Development
- Scientific Computing Users
- Government labs and agencies
- Commercial IT Users
- Startups



Properties of Industrial Research Jobs (1)

- ☺ More time to do research than in academia
 - ☺ Little or no fund-raising. Less time on admin
 - No teaching. No students.
- ☺ Easy to keep up with state-of-the-art, by osmosis
 - ☺ Easier to get guidance on what's practical
- ☺ Many colleagues (colleague \neq student)
- ☺ Often, more opportunity for commercial impact
- ☺ Programming skill is highly valued

Properties of Industrial Research Jobs (2)

- 💣 Susceptible to swings in company's fortune
- ☹ Sometimes less freedom to pick topics
- ☹ Annual reviews
 - What have you done for your employer **lately** (no-tenure isn't all-good)
 - Practical impact is a very important metric



Properties of Product Development Jobs

- Main goal is the product team's success
 - Lots of group activity
 - Focus on the next release
- Produce predictable results, on schedule
 - Programming skill is highly valued
- Broader age demographics
- Work is surely relevant to practice
- Susceptible to swings in company strategy
- Harder to do research, but most engineering problems are challenging and publishable

Changing Careers

Industry \Leftrightarrow Academia

- It's doable
 - There are plenty of examples
- It's not easy
 - There are no formulas
 - Get in at the right level
 - Ramping up (again) is slow
- Industry \Rightarrow Academia
 - Be sure to keep publishing
- Academia \Rightarrow Industry
 - Do some systems work.



If You're a Professor: Why Collaborate with Industry?

- Practical problems
 - More credible research
 - Better chance of impact
 - Practical experience
- Research funding
- Consulting income
- Learn what industry is like
 - Learn what your graduating students will do



How to Create a Collaboration

- Career networking
 - It's an investment. It's marketing.
- Give an industrially-oriented tutorial at a conference
- Be prepared to impress (elevator talk)
- Stop in to chat. Then,
 - Give a talk
 - Help solve a problem
- Find out how to help your contact be more successful



Types of collaboration

- Work on your contact's problem.
 - Use their products.
- Consulting job. Summer job. Leave-of-absence.
- Joint research project
- Student internships
- Course projects



Collaborating

- Learn your partner's overall problem
 - What are their main goals? Main risks?
 - There are more ways to fail than you know
 - Learn their language
- Put some skin in the game.
 - Then they're more likely to follow your advice.
- Avoid becoming a political liability



Legal Issues

- Contracts are facts-of-life
 - Negotiate. Contracts are not carved in stone.
- If you're concerned, get a lawyer
- Patents – There's no pot of gold
 - When contracting with industry, you may need to argue with your university about this. (E.g., due to Bayh-Dole.)
 - See CRA Best Practices Memo: University-Industry Sponsored Research Agreements
<http://www.cra.org/reports/ip/>



Startups

- Prepare for it by working with users
 - Learn about the *real* problems
 - Commercial, scientific, health care, military,
 - Build prototypes. Prototype \neq toy/demo.
 - Recruit users. One user is much better than zero.
- Creating a company
 - Start by consulting and grow slowly.
 - Or get your customers to finance you.
 - Or use venture capital. VCs can help in many ways.
 - Companies fail much more often due to business mistakes than technical mistakes.



Final Advice About Interacting with Industry

- Do it!
- It's extra effort, but it's worth it.



General Advice on a Research Career

- Choose what you're optimizing
 - Recognition, Power, Money, Happiness
- Continually do strategic planning
- Leverage your strengths and your environment's
- Circumvent your weaknesses.
 - Choose one or two to strengthen
- Be opportunistic \Rightarrow Be flexible about switching plans
- Be brave. Dare to be incomparable. No guts, no glory.
- Today's decisions may last a lifetime.
 - Will your research topic matter in 20 yrs? 50 yrs?