



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

- ☺ 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
- ☺ Colleagues (\neq students)
- 💣 Susceptible to swings in company's fortune
- ☹ Sometimes less freedom to pick topics
- ☹ Annual reviews (no-tenure isn't all-good)



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
 - Getting in at the right level
 - Ramping up ... again
- 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 your graduating students will do



How to Work with Industry

- Develop personal contacts
 - It's an investment. It's marketing.
 - Give an industrially-oriented tutorial
 - Be prepared to impress
 - Give a talk, stop in to chat, help solve a problem, ...
 - Find out how to help your contact be more successful
- Types of collaboration
 - Work on your contact's problem
 - 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 and lawyers are facts-of-life
- 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.



General Advice on a Research Career

- Choose what you're optimizing
 - Recognition, Power, Money
- Continually do strategic planning
- Leverage strengths
 - Yours, your employer's, your city's, etc.
 - Skills – problem-solving, brainstorming, speed, personal, teaching, writing, admin, ...
- Circumvent weaknesses
 - Yours, your employer's, your city's, etc.
 - Choose to strengthen one or two weaknesses



General Advice (cont'd)

- Be opportunistic
 - There is no straight path into the future
 - Be brave – no guts, no glory. Dare to be incomparable.
 - Opportunities arrive in increasing order of desirability
- Align your teaching, research & consulting
 - Make them synergistic, not competitive
- Will your research topic matter in 20 yrs?
50 yrs?



Reputations

- A good reputation take time to develop
 - Good news travels slowly
- It is easily lost
 - Bad news travels fast
 - One bad action is one too many
 - Most people won't hear the apology



Final Advice

- Interact with Industry
- It's extra effort, but it's worth it.