Career Paths: How to Get Started in Academia or Industry

Cristina Cifuentes
Sun Labs
Overview

• Background
• Getting started in industrial research
• Case study – research at Sun Labs
• Lessons learned
Background
Getting Started in Industry Research

• Applied research
  > can become a product
  > needs to be justified in the context of the company
  > not just about writing papers and half-baked prototypes
  > a lot of extra effort is required to get a prototype to the level of a product
  > a lot of interaction is needed to get product division interested in outcomes of the research
Getting Started in Industry Research

• Sun Labs career path
  > Member of technical staff
    – recent PhD graduate
  > Staff engineer
    – individual contributor, own a piece of a project
  > Senior staff engineer
    – owns project, talks to the rest of the company
  > Distinguished engineer
    – owns project, recognized externally as an expert in a domain
  > Fellow
    – high level of contributions to the company and industry
    – very few people in the whole company become fellows
Getting Started in Industry Research

- Sun Labs career path
  - Member of technical staff
    - recent PhD graduate
  - Staff engineer ← joined
    - individual contributor, own a piece of a project
  - Senior staff engineer ← current
    - owns project, talks to the rest of the company
  - Distinguished engineer
    - owns project, recognized externally as an expert in a domain
  - Fellow
    - high level of contributions to the company and industry
    - very few people in the whole company become fellows
Getting Started in Industry Research

• My experience
  > Visiting Professor on sabbatical leave
  > Best of both worlds
  > Had own project (binary translation), wanted to know what was needed to apply it in industry
    – academia limited to research outcomes, no tech transfer unless create startup company (was offered VC funding)
    – industry provides opportunity for tech transfer
    – had to learn to get support for the project, not just from engineers but also from their senior management and my own senior management
    – the more different it is, the harder it is to transfer
Getting Started in Industry Research

• Determine your role in the project
  > individual contributor
    – normally when you're junior at the Labs
    – also needed in product groups – junior and senior engineers
  > lead a project
    – normally when you're senior and above at Labs
    – in product groups, normally manager leads a project and senior engineers lead parts of the project
Getting Started in Industry Research

Facts to Take into Account

- No “freedom of research” as per universities
- No basic research or theory-only projects
- Timeframe of projects is short-scale in general
- Less job security
  > “tenure” doesn't mean anything
- Restrictions in terms of tools used
  > productivity tools, sometimes for implementation projects
- May be difficult to go back to academia
  > different criteria
Case Study – Research at Sun Labs

Research Strategy

• Applied research aligned with Sun's Business
• Innovate, Demonstrate, Transfer
  > Create innovative technologies, (i.e. Java), but not the only source of innovation at Sun
  > Use small teams to develop innovative technologies
  > Transfer our Knowledge, Prototypes, People and Projects to Sun engineering
• Contribute to open-source and standards initiatives
Center for Innovation

We're About Surprises ...

Engineering (Business Units)
- No surprises
- Execution on-budget, on-schedule is key
- Eliminate ambiguity
- Incremental product evolution
- Stability

Research (Labs)
- All about surprises
- Execution is important but innovation is key
- Ambiguity is your friend
- Two Innovation options:
  > Substitute products
  > New Markets
- Change
What We Do

- Vision Research & New Technology: 60%
- Consulting & Teaching: 15%
- Community & Thought Leadership: 10%
- Advanced Development & Collaboration: 5%
- Micro-business Unit & New Products: 10%
Lessons Learned

• Choice of project
  > May improve existing technologies and practices
    – product division needs to agree on taking it on board
    – sometimes transfer people to product group
  > May replace existing technology
    – hard to transfer
  > May create a new market
    – difficult to transfer as no product division at the other end
  > May contribute externally to the company
    – contributions to open source code
    – projects not within the scope of the company
Lessons Learned

“Technology transfer is a contact sport.”

Bert Sutherland
Former Sun Labs Director
Lessons Learned

• Division of your time
  > individual contributor
    – mostly research and implementation in the project
  > lead a project
    – research, implementation, service (to the company and the community)
    – learn how to balance
    – and when to say no
  > no formal teaching
    – teach interns new theory, technologies, and skills
Lessons Learned

• When starting a new project
  > feasibility analysis
    – discuss with researchers and product folks
  > propose project
    – have 2-3 year plan
    – proposal based on number of people likely to join project
  > design
    – determine areas of research to tackle
    – determine infrastructure and implications of using such infrastructure
      – software licenses, implications of using open source
    – setup testing infrastructure prior to implementation
Lessons Learned

• Publish or patent or open source?
  > No “publish or perish” rule
  > Patents are important to protect company's IP
  > Papers are useful to communicate one's research and be in touch with the community
  > Contributing to open source is another way to be in touch with the community
    – need to be aware of one's time availability
  > Collaborative research agreements are good to explore new ideas in related areas of knowledge
    – university owns IP
Lessons Learned

Work and life balance

> Life events (e.g., baby is born)
  – can change project
  – can work part-time
  – can work from home
  – no clock is ticking for tenure

> Working remotely (e.g., from Australia)
  – home office or hosted at university
  – more flexibility in life
  – less commute time, less stress (no traffic!)
  – need to be dedicated, like to work independently, have tools to be available (IM, video chat, email, phone)
  – need to create presence on the host site
Career Paths: How to Get Started in Academia or Industry

Cristina Cifuentes
cristina.cifuentes@sun.com