

Academia vs Industry: Choose Your Own Adventure

Deb Agarwal, *Lawrence Berkeley National
Laboratory*

Sujata Banerjee, *VMware Research*

Mary Lou Soffa, *University of Virginia*



A vs B: So Simple, Right?

Industry/Government/ Laboratory could be:

- Engineer
- Research scientist
- Engg./Research Manager
- Leadership
- Consulting
- Start-up

Academia could be:

- Professor at research-oriented university
- Teaching-oriented position
- Academic administration
- Research associate

Turn and Talk to Your Neighbor

What is your plan?

Industry vs Government vs Academia vs Undecided?

Why?

How do you enjoy spending your time?

What are your goals in a job?

About me: Deb Agarwal

Education

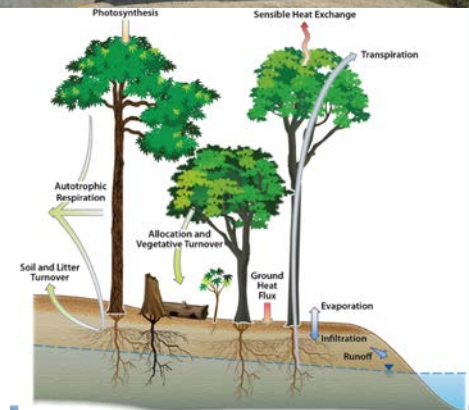
- Purdue University - BSME
- University of California, Santa Barbara - PhD CE
 - Distributed systems

Career Path at Berkeley Lab

- Intern
- Scientist
- Group Lead
- Department Head & Senior Scientist

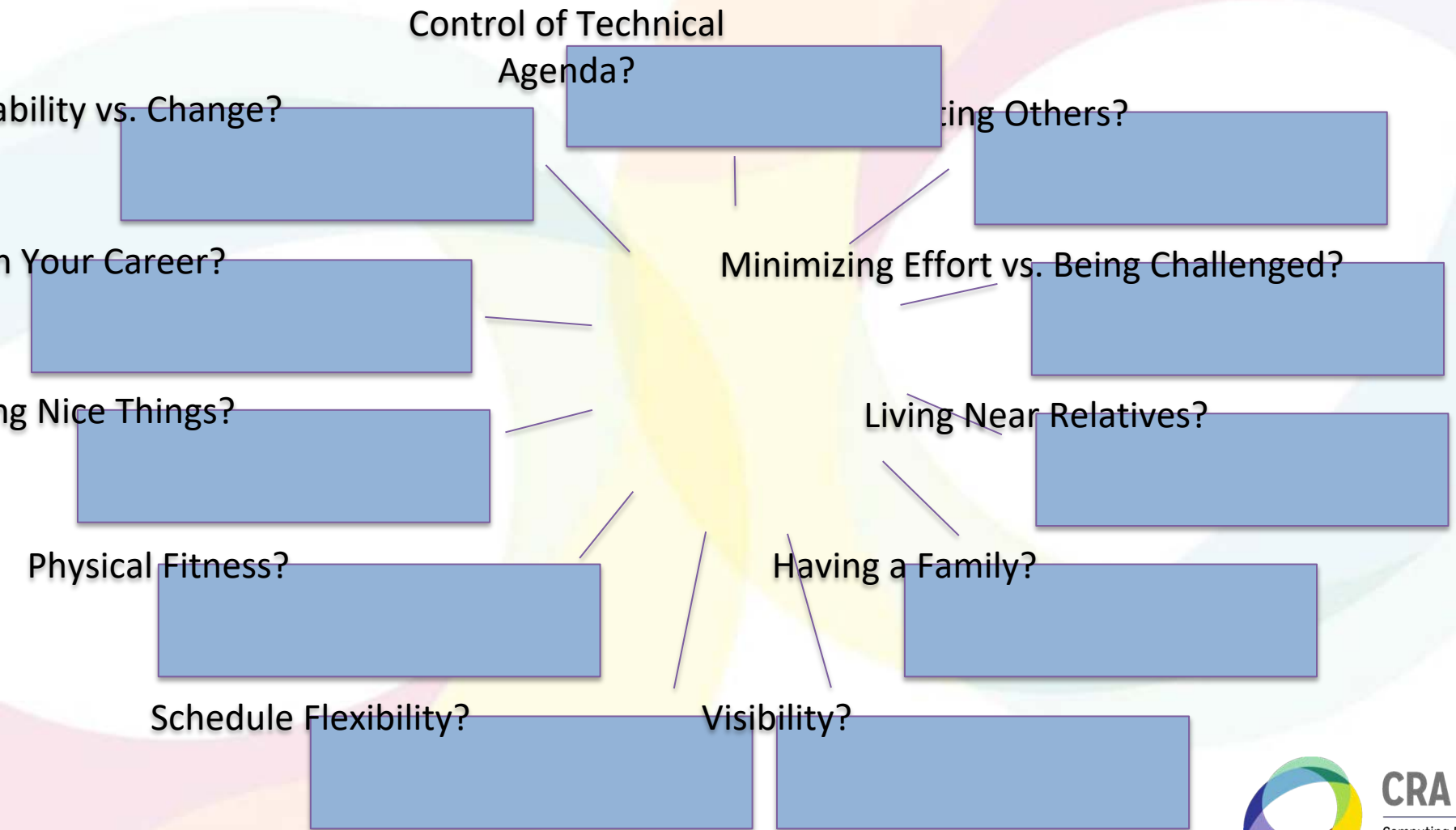
What I work on

- Management - Data Science Dept Head
- Research - Data Science - Data lifecycle topics
- Applied Research - Eco-informatics - Data systems supporting science



What is Important to You?

Must-haves vs. Nice-to-haves?



Does What You're Doing Align With What's Important to You?

- What you value most could change over time
- Absolutely no one is in your exact situation
- A PhD gives you options
- Be true to yourself and your values
- Don't be afraid to course correct

Government Research Labs

Government Research Centers

- DOE, DoD, NASA, NSF, DHS, NSA, NIST, NRC, FAA, ...
- Mission-driven research and development

Why Work at a Government Lab?

- Opportunity to work on problems of national and international importance
- Chance to make a difference
- Work on cross-disciplinary teams with other scientists

Scientist Track

- Postdoc
 - Named - small project internally funded
 - Regular - working as a primary on an already funded project
- Research Scientist
 - Significant leadership roles in projects
 - Smaller projects on own
- Scientist
 - Leadership of projects and proposals
- Senior Scientist
 - Recognized international leadership in area of research
 - Leadership of large-scale projects

Advancement metrics similar to a research university



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Applied Research Track

- Software Engineer
 - Developer on a research project
 - Leadership on development activities

Advancement metrics related to deliverables on projects

What Can You Do Now to Prepare?

- Internships at government laboratories
- Gain experience working on team projects
- Learn how to lead teams
- Build communication skills
- Learn about the various labs
 - types of work
 - qualifications required
 - citizenship requirements
 - funding models

Industry Research Careers

About me: Sujata Banerjee



Currently at VMware Research

Senior Staff Researcher

Research co-Director, External Research

Previous Career

- **Hewlett-Packard Labs**

Distinguished Technologist and Director, Networking Systems Research Grp

- **University of Pittsburgh**

Associate Professor with tenure, Telecommunications Program

Research

Networking: Software Defined Networking (SDN), Network Functions Virtualization (NFV), Energy Efficient Networking, Measurement

Education

Ph.D., Electrical Engineering-Systems, University of Southern California (USC)

B.Tech. and M.Tech.: Indian Institute of Technology (IIT), Bombay

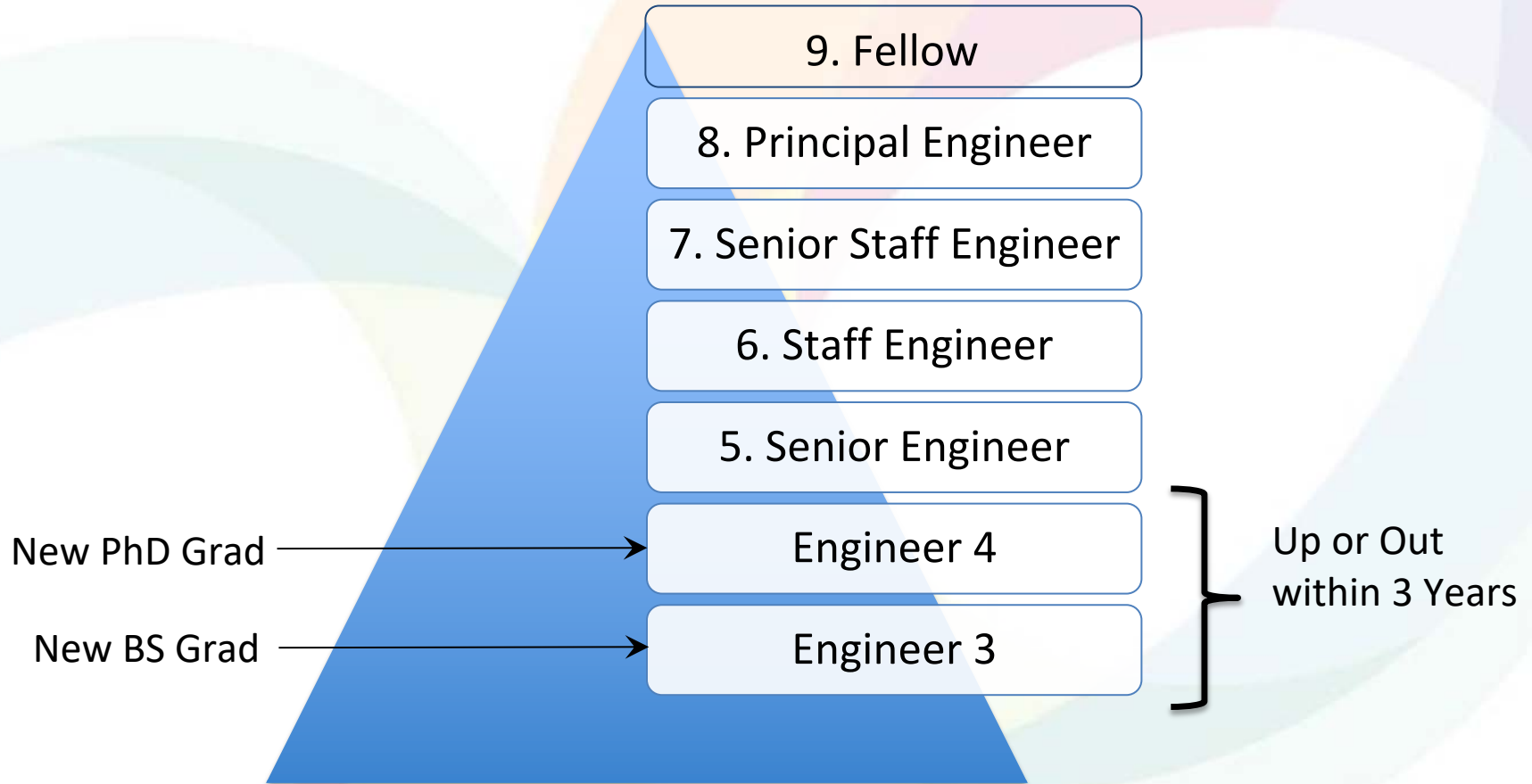
Industry Careers

Role	Visibility	Flexibility
Engineer	Low	High
Research scientist	Medium	High
Engg/Research Manager	Medium (all internal)	Medium
Corporate leadership	High	Low
Consulting	Low	Varies/Low
Government	Medium	High
Start-Up	Low	Low

Same role can vary a lot from group to group

The Engineering Ladder

Titles may vary across companies



Industrial Research Career

Differences and similarities with academia

Research Agenda

- May not be totally unfettered
- May be more applied than pure

Publishing Papers

- Typically encouraged – extent varies
- Not always a requirement for success

Research Funding

- Internal project approval
- External funding for joint University-Industry initiatives

Tech Transfer

- An important goal for industrial researchers - Typically hard!
- Patents and open source contributions count

Participate in conferences

- Technical Program Committees
- Organization committees

Teaching/Students

- Interns and student mentorship
- University collaborations
- Teaching opportunities at local Universities
- Ph.D./Masters student advising

How to prepare for an Industrial Research Career?

Similar to what you would do for an academic career

- Learn about the research process: identify important research problems, problem formulation, build solution artifacts, publish
- Go to conferences: learn to network
- Learn to “sell” your research ideas

Internships in industrial research and product organizations, start-ups

- Learn about the company you work for: leadership, products, services, growth areas, customers, market segments, competitors
- Interactions between business units and research

Evaluate what you really enjoy doing

- Tangible vs open ended problems
- Seeing your research realized into products and used by customers
- Publishing and Teaching/mentoring



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Academic Careers

About me – Mary Lou Sofa

Currently

Owen R. Cheatham Professor
Department of Computer Science
University of Virginia

Previous Career

Professor, University of Pittsburgh
Dean of Graduate Studies, University of Pittsburgh
Chair of the Computer Science Department, UVA

Research

Software Engineering, Programming Languages,
Software Systems, Architecture, Cloud Computing

Academic Career Ladder

Professorial Ranks

- Assistant: Tenure-track, 5-7 years
- Associate: Usually with tenure
- Full (no set time limit to achieve)
- Chaired Professor – endowed

Administrative Ranks

Department Chair/Head, Dean, Provost, President

Teaching Faculty

Can vary significantly on course load
Some roles offer tenure equivalent

Postdoctoral/Research Associate

- Usually on “soft money”

Traditional Professor/Instructor Roles

Research universities

- Ph.D. program - emphasize *research, funding*

Teaching-oriented colleges

- B.S. program – emphasize *teaching, service*

Public vs. Private

- Impacts funding structure

What can I do now to prepare for an academic job?

- **Research**

- Apprenticeship: learn from advisor, write papers, collaborate
- Grant writing: Help out on proposals, read successful proposals
- Corporate connections (for funding, student job placement)

- **Teaching**

- Guest lectures, teaching assistantships
- Professor-in-training programs, courses

- **Service**

- Organizing student organizations/support groups – Women in CS
- Working on department committees
- Volunteering at conferences

Career Change

Moving Between Industry and Academia

From University to Industry/Government

- Must build real systems
- Establish visibility and knowledge in industry
- Need to pass a technical interview

From Industry/Government to University

- Must continue publishing
- Establish visibility and reputation in research community
- Need to pass an academic interview (presentation, strong publication record)

All Choices are Valid!

- Do what you love
- If you don't love what you're doing, do something else
- A PhD gives you that option
- Take ownership of what you do now and what you want to do next

Aspire to be **happy** - not '*stereotypical*'

Questions ?



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