What Does an Industrial Researcher Know or Care About Students and Mentoring?

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Largely stolen from:

Ultimate Frisbee & You

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How your students' extra-curricular computing experiences can make you a better teacher, adviser & researcher

Thank you, Mary!
The Good News

Distribution of Projected S&E Job Openings
(new jobs plus net replacements) 2006-2016

The Bad News

Annual Degrees and Job Openings in Broad S&E Fields (2006-2016)

So, We *Have* to Care!

- But what do we *know*?
- We know how to get jobs
  - In industry, of course
  - But we also write lots of letters for academia
- We know how to be successful
  - In industry, of course
  - But we write lots of promotion letters for academia
  - And we are often well-connected
- We can help students succeed – and we must!
  - Otherwise, who will be our successors?
Your Mission

• Attract, retain, and graduate future computing professionals
  – Developers, engineers, architects
  – Project, program, and product managers
  – Designers, entrepreneurs
  – Lawyers, writers, K-12 teachers, …
  – Oh, yes – and the next generation of professors!

• Leverage “extra-curricular” programs
  – Summer internships
  – Mentoring programs

• It’s not only your mission – it can be good for you, too!
Internships for Undergraduates

- Summer in industry, national lab; NSF REU; Co-ops
  - [http://www.acm.org/crossroads/resources/internships.html](http://www.acm.org/crossroads/resources/internships.html)

- What's in it for the student
  - Window on future;
  - Workplace readiness;
  - Potential employer

- What's in it for you
  - More mature, motivated students;
  - Good PR for your department;
  - Potential collaborations

- What to do
  - Encourage BEST students to apply
  - Think BROADLY: all STEM fields need CS majors
  - Influence culture: Set expectations in class, reward students, advertise & communicate with employers, share experiences
Internships for Ph.D. students

• Every PhD student should have at least one internship in an industrial or national lab
  • Summer or anytime; earlier, the better; before 4th year

• What's in it for the student
  • Exposure to real, hard problems in context
  • Exposure to a different career path – better decisions later
  • Potential publications & dissertation subjects
  • Letters of recommendation
  • A permanent job?

• What's in it for you
  • Establish (long-term) collaborations
  • Potential funding source
  • Better prepared students – your legacy
Internships for Ph.D. students

• What to do

  • Encourage your BEST students
  • Plan WAY ahead (DECEMBER)
  • Reach out, by email or phone
  • Think Local – easier to maintain local collaborations
  • Think Global – global experience can be a leg up these days
  • Provide student time to bootstrap before internship begins
  • Have student give a talk when they return
  • Look for publishable material
  • Encourage them to stay in touch with their mentor
MentorNet www.mentornet.net

- Award-winning E-mentoring program
- Pairs protégés with experienced professionals for email-based relationships
- Community college, undergrad & graduate students, post-docs, un-tenured faculty
- 30,000+ pairs since 1998
- Real-world information, encouragement & advice
- Life-long professional & personal relationships
- Large pool of mentors in computing
- Diverse skill sets, job functions, educational backgrounds
- Free to any student with .edu email
Homework Assignments

• Engage yourself
  • Learn more about extra-curricular programs supported by your dept, division, university, NSF, DARPA, DoE, CRA, ...
  • Find a mentor outside your department

• Engage your students
  • Professional life begins in first CS class
  • Promote a culture of apprenticeship & professionalism

• Engage your department & chair
  • Manage up!
  • “Enriching Undergraduate Learning through Apprenticeship” at CRA 2010 biennial (http://www.cra.org/events/snowbird-2010/)
Good Mentors

• Are people you like
  – You are comfortable talking to them
  – You respect their judgment

• Are people you’d like to grow up to be
  – In some respect! Know what you want from them!
  – Not just someone you generically admire

• Are people who can identify with you
  – Not so far removed that they don’t understand your problems

• Are people who will be honest with you
  – Minimize conflicts of interest

• You can have multiple mentors!
  – Diversity of opinions are generally a good thing
  – Some mentors are better for some discussions than others
  – No one has all the answers
Be a Mentor
Have a Mentor
Your Entire Career
Be Good to Your Students
They Are Our Future