
How can academia and industry
work together
to address educational issues?

Panel Presentation

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IBM University Relations Programs

- **PhD Fellowships**

- Tuition + Stipend + Summer Internship
- Candidates nominated by academic departments each year

- **Faculty Awards**

- Each award is about \$40K per year
- Candidates nominated by IBM researchers

- **Shared University Research (SUR) Program**

- Equipment award program
- Proposals developed jointly by faculty and IBM researchers

Additional Programs at IBM Laboratories

- **Summer Internship Programs**
 - Graduate students at research labs for up to 12 weeks.
- **Academic Visitor Program**
 - Faculty visiting a research lab for an extended period (one academic term to one year).
- **Postdoctoral Scholars Program**
 - One-year or two-year appointment at a research lab.
- **Centers for Advanced Studies**
 - 21 worldwide; located at software development labs
 - Collaboration with academia: internships, sabbatical visits

Key Questions

- What are ways in which industry can help address the crisis in computing (increasing CS enrollments, promoting greater diversity in the field, etc.)?
- What are possible effective means for academic/industry collaboration (in addition to and beyond just monetary support)?

Possible Answers

- **Student Programs**
 - Summer Internships
 - Co-op Programs
- **Mutual Exchange Programs**
 - Long-term faculty visits in industrial labs
 - Industrial researchers teaching at universities
- **Improved academia & industry intellectual property practices**
- **Industry sharing data with academic researchers**

Student Programs

- **Summer internships for undergraduate & graduate students**
 - Standing agreements with local universities.
 - Guaranteed internships for qualified students.
- **Co-operative education programs for undergrad. students**
 - Five-year program alternating between school and work.
 - Implemented with great success at the U. of Waterloo: four months long work terms; up to two years of relevant work experience.
- **Advantages**
 - Complement academic experience with relevant work.
 - Both students and industry benefit.
 - Helps underprivileged students, increases diversity.

Mutual Exchange Programs

- **Faculty visits in industrial labs**
 - Long-term visits, often combined with a sabbatical leave
 - Faculty spend time in research labs or software development labs.
- **Industrial researchers teaching at universities**
 - Industry grants researchers release time to teach at local universities.
 - Upper-division undergraduate & graduate courses.
- **Advantages:**
 - Promotes interaction between industry & academia.
 - Brings new skills to the classroom, enriches the instructional experience.

Improved Intellectual Property Practices

- Intellectual property issues are a **complex** problem and challenge.
- Intellectual property is often an **obstacle** to collaborative engagements between academia and industry.
- Typically, a separate IP agreement is required for every separate engagement between academia and industry.
- Much is to be gained by streamlining IP agreements, adopting blanket IP agreements covering a spectrum of collaborative engagements between academia and industry.
- But there are **no** easy answers ...

Sharing Data with Academic Researchers

- Experimental computer science is relatively inexpensive (unlike physics, biology, ...)
- Experimental computer science gives students an opportunity to become engaged in research early.
- Yet, experimental computer science is still at a rather undeveloped stage.
- Lack of real-world data is a serious obstacle to the development of experimental computer science in academia.
- But industry data are proprietary ...

Finally, let us not forget K-12 Education

- Computer science curriculum in elementary and high school education is virtually non-existent (AP courses in CS notwithstanding).
- Industry and academia can work together towards developing and putting into place a CS curriculum for K-12 education.
- In the long run, this may be the answer to the declining enrollments in computer science.
- There is a need for innovative programs in this area
 - [IBM Transition-to-Teaching Program](#) (started in 2005): transitions professionals to a second career in teaching.