Why Industry-Academia Collaborations Panel?

- Companies depend on innovation to stay competitive – that means tapping the best and brightest minds, some of the finest concentrations of which can be found at universities

- Universities depend on cutting-edge research projects that meet the need of the society and the industry – that means strong links to the industry, its information and data resources as well as its experienced researchers that have numerous challenging real-world research problems

- The two, therefore, make a perfect match for collaborations
Questions/Challenges

Industry Challenges:
What are the most pressing challenges facing industry researchers when seeking younger researchers to Innovate new services & products serving the society? How to reduce the gap between the skills of fresh university graduates and the needs of the industry?

Academia Challenges:
What are the most pressing challenges facing university researchers when suggesting dissertation topic to their PhD students? How to fund research projects and PhD students? How to produce graduates that can immediately be absorbed by the industry and serve the society through research and innovations directly applicable to the industrial needs.
Questions/Challenges

Joint Challenges:
What are the challenges related to the administrative issues of collaboration including the legal process & procedures as well as protection of the Intellectual Property Rights of academia and industry? How the industry – academia collaboration can benefit both sides in a cost efficient manner resulting in a “win-win” scenario?
Panelists

Dr. Fiona Williams, Research Director, Ericson

Dr. Marek Rusinkiewicz, General Manager of Applied Research Laboratories, Telcordia Technologies

Prof. Dr. Hans-Joachim Grallert, Chair for Telecommunications at Technical University Berlin, Managing Director Fraunhofer Heinrich Hertz Institute Berlin

Dr. Hendrik Berndt, CTO & Senior Vice-President of DOCOMO Communications Laboratories in Europe

Dr. Flavio Bonomi, Cisco Distinguished Engineer & Head of the Advanced Architecture & Research, Cisco
AT&T Labs Research
University Collaborations Research Program

ICC 2009, Dresden, Germany

Mahmoud Daneshmand, PhD
Executive Director, University Collaborations Program
AT&T’s patent portfolio includes over 6,000, issued and pending applications

Over 75% of our researchers hold a PhD degree

Heritage includes 7 Nobel Prizes

“People, Purpose and Environment – The requirements for success”

Dr. James B. Fisk
*Head of Bell Telephone Laboratories in 1959-1974*

AT&T Labs Locations

- San Ramon, CA
- Austin, TX
- Middletown, NJ
- Atlanta, GA
- Florham Park, NJ
AT&T Labs, Inc.

The Innovation Engine Behind AT&T’s World-Class Technology

- 1,100 of the world’s best scientists and engineers
- 130 years of technology breakthroughs and product/service innovation
- Currently involved with over 50 U.S. & International Universities
Making History

- Telephone Invented
- First Transatlantic Phone Call
- The Big Bang Echo
- Cellular Phone
- C++
- First Transcontinental Phone Service
- Speech Synthesis
- Laser
- Fiber Optics Communications
- UNIX/C
- WiFi Standards, VXML, S/T Encoding

- Late 1800's
- 1910's
- 1920's
- 1930's
- 1940's
- 1950's
- 1960's
- 1970's
- 1980's
- 1990's
- 2000's
AT&T Labs UC Research Program

Goal

To have direct and first hand access to Technology, Knowledge, and Innovations at global academic institutions,

To maintain and increase vibrant relations with the academic community for the purpose of experience and knowledge sharing,

To enrich the selection of future full-time research hires,

To promote joint research collaborations leading to faster industrial innovations and enhanced academic education.
AT&T has a long history of university collaborations – close to 100 years. We have been using many different approaches for our formal university research collaborations. One approach, called VURI (Virtual University Research Initiative) has been more popular.

Let me spend couple of minutes to introduce VURI
AT&T Labs UC Research Program

VURI (Virtual University Research Initiative)

VURI is a joint research program between Universities and AT&T Labs designed for PhD students to conduct their dissertation research on a problem of interest to AT&T under the joint supervision of their professor and a Labs researcher:

VURI builds teams: (University Professor, PhD Student, Labs Researcher),
AT&T Labs UC Research Program

VURI (continued)

Each team specifies a well defined research problem directly applicable to the AT&T business needs,

The PhD student works as a summer intern at the AT&T Labs,

AT&T supports the educational expenses of the PhD student by providing research funds to the student’s Professor under certain “Gift” and “IP Right” agreements
University Collaborations

VURI:
25 Universities, 35 Teams, 35 Joint Research Projects, 35 Interns

Annual UC Symposium:
http://www.research.att.com/ucollaborations
ICC’09
Industry-Academia Joint Research Collaborations

Dr. Fiona Williams
Ericsson Research
Types of collaboration

- **Bi-lateral cooperation examples**
  - Student thesis cooperation
  - Contracts for specific research
  - Sponsorship of programmes

- **Collaborative project examples**
  - Framework Programme projects
  - EIT KIC Clusters
  - National research programmes

- **Organisation based collaboration examples**
  - eMobility
  - Wireless World Research Forum

- Small scale collaboration
- Often standard contracts for students
- Individual contracts for sponsorship
- Standard EU Grant Agreement
- Standard agreement for national projects
- Standard agreements on IPR conditions
- No formal legal framework for collaboration (all contributions are in the public space)
Ericsson Research Branches

Switzerland
- Kista
- Luleå
- Linköping
- Mölndal
- Lindholmen
- Lund

Montreal
RTP
Silicon Valley
Aachen
Madrid
Pisa
Budapest
Helsinki
Tokyo
Beijing
International Cooperation
Research Institutes and Universities

Focus on collaboration with leading institutions & graduates interested to have their work used in products and services
Technology Leadership
Ways of working

- Competence, IPR, concepts
- Research
- Test-bed
- Standardization
- Beta test
- Demonstrations
  Proof of concept
- Product development
- Global Standards,
  http://labs.ericsson.com/
- Time
- TTM

Competence and knowledge

http://labs.ericsson.com/
EMobility Vision of Daily Life in 2020

Freetime

Entertainment

Work

Doing (alone)

Automating (machine-to-machine[s])

Utility

Talking & Messaging (person-to-person)

Sharing (one-to-some)

Publishing (one-to-many)

SET – Simplicity, Efficiency and Trust
Membership – 623 members

Total number of members 623

Industry 126
Research 222
SME 243
Liaison 32

Steering Board of 22 members (all elected) +
Expert Group
Mirror Group
Executive Group
Industry-Academia Collaboration Panel
ICC 2009

Marek Rusinkiewicz
Telcordia Applied Research Laboratories
marek@research.telcordia.com

June 2009
Telcordia Applied Research Labs

- Over 250 researchers in telecommunications engineering, computer science, math and information technologies, with labs in New Jersey, Maryland, Texas, (Taiwan, Poland)
- Renowned for research and development in areas of ADSL, ATM, ISDN, SONET, Video on Demand, Voice-over-IP, software testing technologies, malicious code detection, etc.
- Core competence in:
  - Network and Services Management, Security and Integrity, Optical Networking and Broadband Access, Mobile IP, Wireless and ad-hoc Networking
  - Software technologies, Network Security, Information analysis and assurance, Mathematical Sciences/Statistics
- A source of industry leadership and innovation
  - Among leaders in patent citations, with more than 1800 patents issued worldwide
  - Major contributor to standards and industry forums
Industry-Academia Collaboration Issues

• Industrial labs have good insights into real research problems, but the information sharing is often complicated by competition-sensitiveness
  – Abstraction into challenge problems
  – Dialog about important hard problems and models
• Industrial labs have access to real data, but our ability to share them is restricted by confidentiality requirements
  – Data obfuscation and anonymization
  – One approach: publish data as sets of (measurements) points in metric spaces
  – Computation on encrypted data
• Reproducible research over standardized sets of test data
Industry-Academia Collaboration Mechanisms

- Sabbaticals, internships, summer jobs for academics at industrial Labs
- Adjunct positions for industrial scientists at Universities
- Term Projects, Master Projects, Dissertation Topics
- Industrial Advisory Boards
- Curricula
  - Conflict between the emphasis on solid foundations (math, reasoning) and the desire to cover “marketable skills”
  - One promising approach uses threads,
    - CS + x
    - Communications + X
  - Network Science – social, information, communications
  - Liberal arts based network engineering program?
Major Problem that Needs to be Solved: Intellectual Property

- University want on their share of IP revenues, but often they are not well prepared monetize IP
- Funding models for engineering research
  - Industry funded research – no IP rights for Universities
  - DARPA – government use rights, with the commercial rights retained by the research institution
  - EU Frameworks -- IP agreements up-front
  - NSF -- no funding for industry (resulting sometimes in “academic” projects and unsupportable claims)
  - Cost-sharing is not a panacea and presents problems for all parties
Industry-Academia Collaborations Panel
Prof. Dr.-Ing. Hendrik Berndt
The biggest challenge university graduates face when finishing university and starting in the industry is the change of working cultures.
Needed Skill Sets

• Industry needs skilled people able to identify real-world problems, strip them to their core and look up for solutions

• Innovative solutions come up only with open-minded people that possess a very wide view on the problem scope and the range of possible approaches able to solve it

• Essential is to move researchers from academia closer to real problems, the ones that industry looks at everyday. Industries should inform through seminars, invited lectures etc. about the people they are searching for
Pure Research vs. Industrial Problems

The challenge of exciting a PhD student for research relates to the contrasting needs of the pure research world - looking always for ground-breaking ideas - even worse research for the purpose of research, & the industrial world - often focused on short-term solutions for the most pressuring market needs.
Pure Research vs. Industrial Problems

→ But graduate students can be attracted from the perspective of getting a PhD by engaging in research tasks that at the end bring them directly in touch with the industrial world - without losing 4-5 years in limbo, whose exit is only the academic research

→ Collaborations help Universities to better understand the industry problems

• Sometimes real world problems serve as door openers for further scientific work
The role of academia is to give the instruments, the role of industry is to tell which tune to play.
“Win-Win” Scenario

- **Academia** should not pressure to much on making money out of IPRs that result from industry collaboration. It can benefit from industrial collaborations in many other ways e.g. creating a cutting-edge research pool, where companies invest their money, giving importance and credibility to the university attracts students and researchers to study and work there.

- **Industry** provides its presence, creates new facilities, research labs, jobs. The outcome of research can also be conveniently serve the community e.g. industry’s funded research is deploying its inventions to improve services available across the campus.
Academia is more concerned with publications, while...

My friends, as a result of our experimentation, we have just lost a dear and valued colleague....

On the other hand, we have just gained a publication.

Cartoon by Nick Kim, www.nearingzero.net
Industry research concerns the transfer of results!
Hendrik Berndt
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Fraunhofer Institute for Telecommunications

Heinrich-Hertz-Institut
Berlin

Industry-Academia Collaborations Panel
ICC 2009, Dresden, Germany

Prof. Dr.-Ing. Hans-Joachim Grallert

http://www.hhi.fraunhofer.de
Short Introduction

Hans Grallert
• 7 ys Technical Universities
• 23 ys Industry (Research, Development, Management, CEO)
• 5 ys Managing Director of Fraunhofer Heinrich Hertz Institute,
  (240 employees, Budget 25 mio €),
  Chair for Telecommunications at Technical University Berlin

Fraunhofer Association:
• Largest Organisation for Applied Research in Europe
• Model of Performance based Financing,
• Support of Industry with Research and Development

Talk is mainly restricted to situation in Germany and Europe
Research Funding in Germany and Europe

Germany

Hightech Strategy, Focus on 17 strategic fields
Information and Communication technologies

......
Increase of collaboration between economy and sciences
Fast conversion of research results into products, services......
Special funding programmes and support for SMEs

Europe

FP7: Framework Programme for Research and Technological Development
strengthen the scientific and technological base of European Industry
Industry Challenges (1):

What are the most pressing challenges facing industry researchers when seeking younger researchers to innovate new services and products serving the society?

- Work is accomplished in teams
  - Lack of economical, social and legal competencies
  - Faster access for researchers with experience in cooperation projects
Industry Challenges (2):

How to reduce the gap between the skills of fresh university graduates and the needs of the industry?

To much focus on high qualified researchers (PhD, post-docs) ?
Establish a looking forward plan about the needs of the industry
Professors have a lack of industry experience

Young graduates have to be prepared for lifelong learning
Sabbaticals for industry engineers ?

No complains about too less engineers, too less women ??
Academia Challenges (1):

What are the most pressing challenges faced by university researchers when suggesting dissertation topics to their PhD students?

Find research topics, where industry is interested in topics out of common research projects makes transition to industry easier for the PhD

Conflict publishing vs. not publishing
Universities are interested in and dependant on publishing ( ranking, citation indices…)
Industry to avoid publishing because competition
Academia Challenges (2):

How to fund research projects and PhD students?

Refer to Research Funding in Germany and Europe

Most of projects are not funded by 100%
Expectation of financing by industry or research institutes have to have admission to sell / licence results

Need for more 100% funded projects,
e.g. basic research, less interest from industry
Academia Challenges (3):

How to produce graduates that can immediately be absorbed by the industry and serve the society through research and innovations directly applicable to the industrial needs

Refer to Industry Challenges (2)

Too much focus on high qualified researchers (PhD, post-docs) ?
> need for well qualified engineers

Establish a looking forward plan about the needs of the industry
Professors have a lack of industry experience
Joint Challenges (1):

What are the challenges related to the administrative issues of collaboration including the legal process & procedures as well as protection of the Intellectual Property Rights of academia and industry?

Industry wants to own all results exclusively

Legal situation in Germany:
Inventions belong to inventors > work contract > employers (universities, research institutes, etc) > employers own all rights

As long as there is no 100% funding of universities and research institutes they have to make money of patents
Joint Challenges (2):

How the industry – academia collaboration can benefit both sides in a cost efficient manner resulting in a “win-win” scenario

Industry finances more Ph. D. students. For the industry this is a cost efficient manner to stay on top with cutting-edge research and for the University this is a good opportunity to have close contacts with industry and an enabler for high-level research projects.
Fraunhofer Institute for Telecommunications

Heinrich-Hertz-Institut
Berlin

Thank you very much!

Prof. Dr.-Ing. Hans-Joachim Grallert

http://www.hhi.fraunhofer.de