

What Makes a Strong (CS) Department?

Experiences from ETH and Carnegie Mellon

Markus Püschel
 Computer Science
ETH zürich

Oldest universities in continuous operations

University of Bologna
University of Oxford
University of Salamanca
University of Cambridge
University of Padua
University of Naples Federico II
University of Coimbra ^[19]
University of Macerata ^[19]
University of Valladolid
University of Alcalá
Sapienza University of Rome
University of Perugia
University of Florence
University of Pisa
Charles University of Prague
University of Siena
University of Pavia
Jagiellonian University
University of Vienna
Ruprecht Karl U. of Heidelberg

Computer science rankings

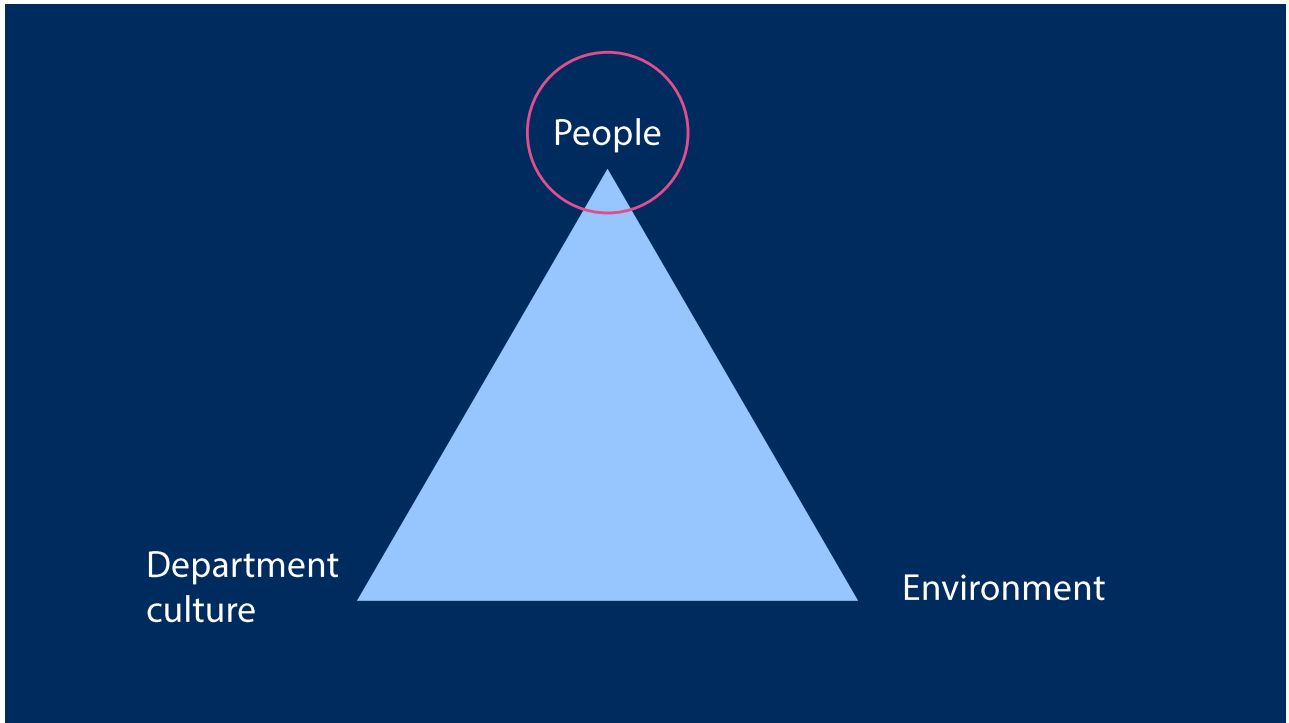
US News

MIT
Tsinghua University
Stanford University
Nanyang Tech. University
UT Austin
Harvard University
UC Berkeley
Nat. University Singapore
City University Hong Kong
Princeton
Huazhong U of Sci and Tech
Hong Kong U of Sci and Tech
Shanghai Jiao Tong Univ.
University of Southern Cal.
Zhejiang University
Georgia Tech
UC San Diego
U Waterloo
ETH Zurich
University of Toronto

Times higher education

Stanford University
MIT
University of Oxford
ETH Zurich
University of Cambridge
California Inst. Of Technology
Carnegie Mellon University
Georgia Tech
Imperial College
EPFL
Harvard University
Princeton
Nat. University Singapore
University of Edinburgh
Cornell University
Technical University Munich
University of Washington
University College London
Columbia University
Tsinghua University

Source: Wikipedia



Faculty Hiring: Principles

Tenure track system: synchronize with international hiring

Default: assistant professors

Open as broadly as possible and every year, advertise through network

Interviews are symmetric, "perfect hosting"

Full 2-day schedule ([schedule all](#), [schedule one](#)), feedback from all

Judge the work and the person, not some metrics

Diversity (opposite: inbreeding)

No language barriers

Student (Bachelor/Master/PhD) Recruiting

PhD recruiting at CMU

US versus Europe

Bachelor/Master

Mobility of students

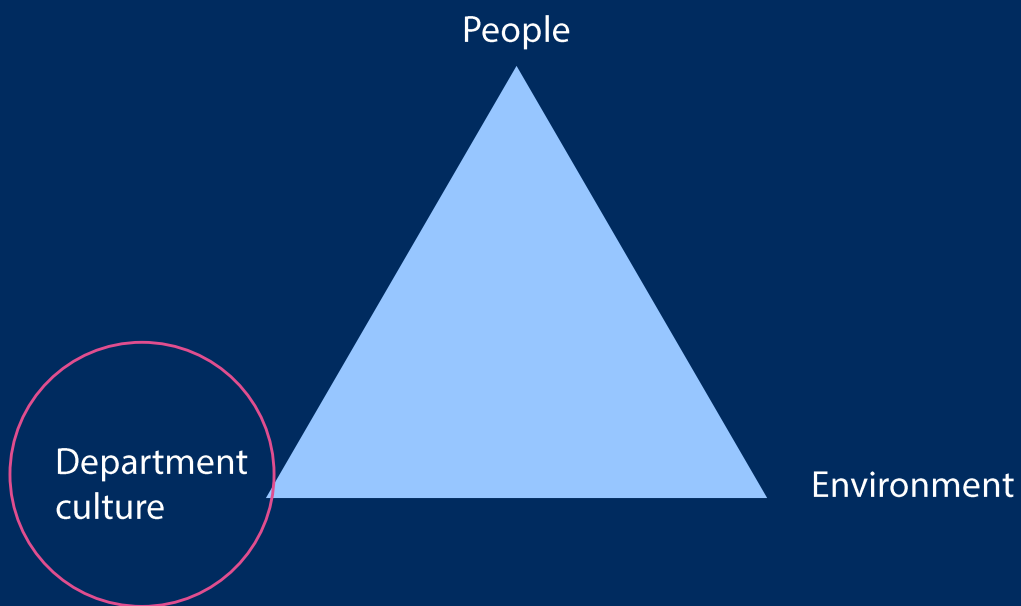
Central, departmental PhD application system

Make yourself visible/known

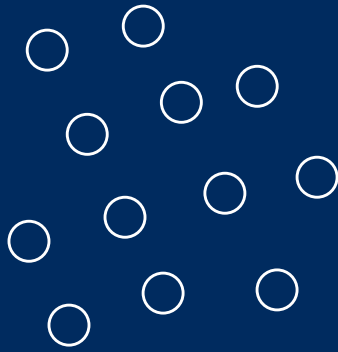
Exchange programs

Summer research programs

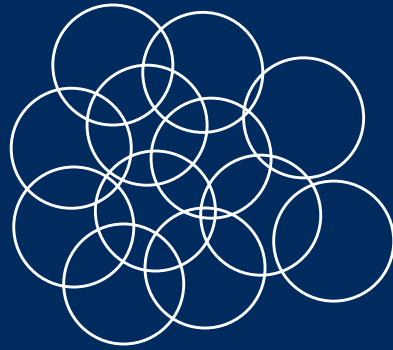
Diversity/language barriers



How Does Your Department Look?



or



Research Areas CS/ETH

Networked Systems & Parallel Computing



Adrian Perrig, Friedemann Mattern, Alonso, Markus Püschel, Donald Kossmann



Peter Arbenz, Thomas Gross, Torsten Höfler, Timothy Roscoe

Data Management & Machine Learning



Andreas Krause, Donald Kossmann, Alonso, Joachim Buhmann, Moira Norrie



Marc Pollefeys, Peter Widmayer, Thomas Hofmann, Timothy Roscoe

Theory & Algorithms



Angelika Steger, Bernd Gärtner, Emo Welzl, Juraj Hromcovic



Peter Arbenz, Peter Widmayer, Thomas Holenstein, Ueli Maurer

Visual Computing



Joachim Buhmann, Markus Gross, Marc Pollefeys



Otmar Hilliges, Diga Sorkine

Pervasive Computing & Cyberphys. Systems



Andreas Krause, Friedemann Mattern, Alonso, Markus Gross



Marc Pollefeys, Moira Norrie, Otmar Hilliges, Srdjan Capkun

Information & System Security



Adrian Perrig, David Basin, Srdjan Capkun, Ueli Maurer

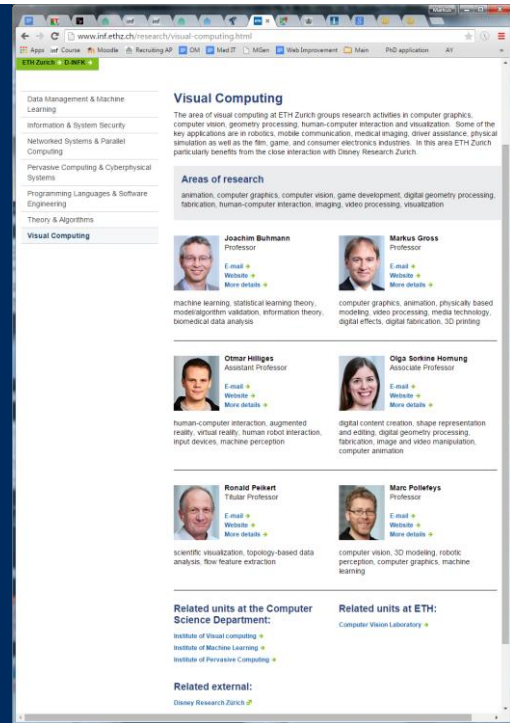
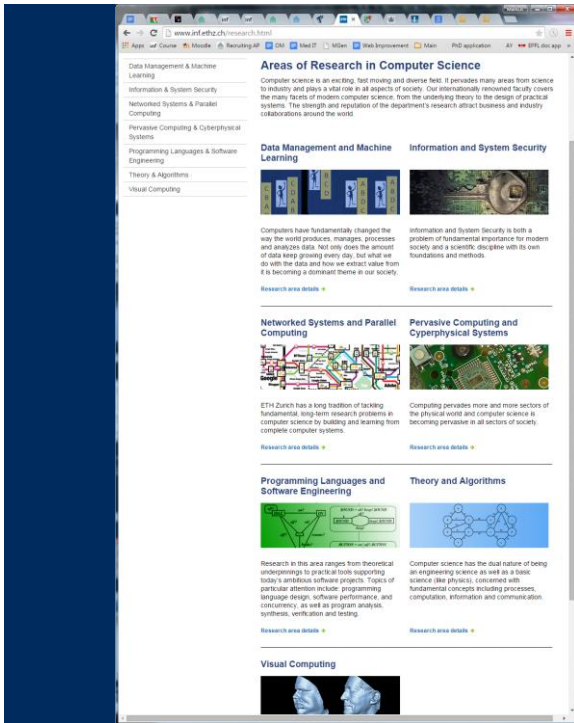
Programming Languages & Software Engineering



Bertrand Meyer, David Basin, Martin Vechev, Peter Müller



Marcus Püschel, Thomas Gross, Torsten Höfler



Department Leadership Structure

CMU

ETH

How To Get There

Hire the right people!

Joint activities

- Hiring

- Evaluation of assistant professors

- Strategy development

Multiperson department management team

Rotating service functions

Weekly lunch seminars

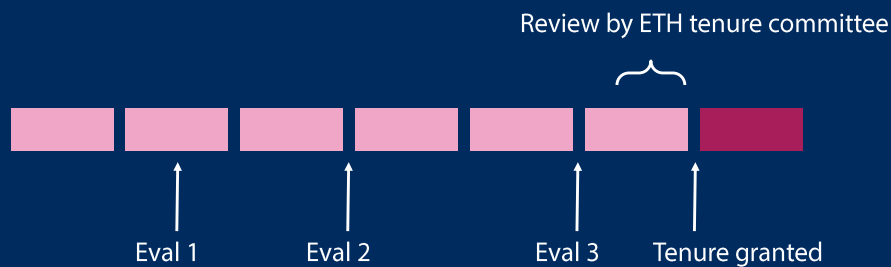
Department funds

Tenure Track System at ETH

At ETH possible since 2004

In our department: first hire 2006

ETH-wide revision in 2014



Tenure Track System: Principles

Assistant professors: full independence, full rights

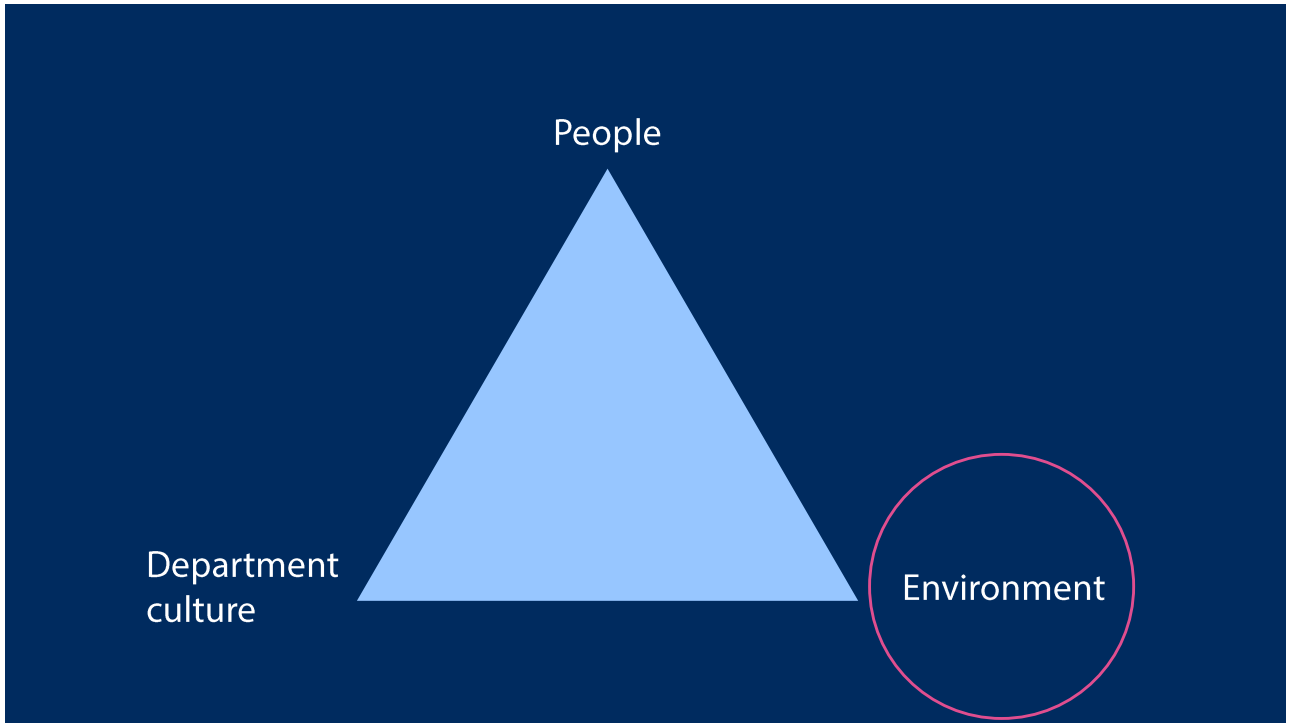
After x years you are fully in or out

“Friendly” system

Mentoring, reduced teaching load

Evaluation by the entire department

Introducing a tenure track system is a culture change and difficult



Important Factors (University/State/Regulatory)

Relevance of CS recognized

Autonomy (department and university), freedom to change

Leadership possible and valued

Monetary support

Educate your environment

Importance of CS, Academia

What happens elsewhere

Summary

How will the future global academic landscape look?

Europe \neq US (but there is a lot to learn)

European CS departments/universities need to modernize

- Learn (but don't necessarily copy) from the best
- Think more international, embrace (enforce) diversity
- Be flexible with language barriers
- Work on visibility
- Empower the young
- Build departments, not institute (or professor) collections
- Don't get obsessed with metrics
- Educate your environment
- Invest