Computing: depth or breadth?

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MY JOURNEY
1968 - PRESENT
My history

- Bachelor of science in Electrical Engineering and Computer Science, MIT
- Master in Computer Engineering, PhD in Computer Science, Case Western Reserve University
- Assistant Professor, Computer Science Department, University of North Carolina
- [10 years in industry in Silicon Valley]
- Professor of Distributed Systems, Technical University of Vienna
- Dean of the Faculty of Informatics, University of Lugano
“Computing may be the fourth great domain of science along with the physical, life and social sciences”

Yesterday...
WHERE WE COME FROM

ELECTRICAL ENGINEERING, PHYSICS, MATHEMATICS
“Computing may be the fourth great domain of science along with the physical, life and social sciences”

Proliferation of hyphenated fields

- Computational physics, chemistry, biology, ...
- Computational geology, mathematics, ...
- Computational culture, sociology, linguistics...
- Social computing, public interest computing, ...
- Web informatics, {Security, Media} informatics
- {Medical, Health, Health Communication, Bio} informatics
- Computational Informatics
Implications for

- Individual researchers
- Department level in university
- Discipline
- Profession
Individual Researcher

- Should I specialize in core computer science or take my computer science expertise into an application field?
- Where do I publish?
- Am I just a programmer?
- Where do I get funding?
Department Level

- How do we divide the budget?
- Do we hire computer scientists or application level experts?
- Are we producing just programmers or scientists?
Discipline and profession

- Are we a unique science or are we (only) providing a service to other disciplines?
- What does a certification as a computer scientist guarantee?
- Are application specialists computer scientists?
Teaching

- Who are our students?
- What do we produce?
- What do we teach?
  - MIT model
  - Stanford model
ACM-IEEE Computer Science Curriculum

- Curriculum '68
- Curriculum '78 (core knowledge)
- CC1991 (knowledge units)
- CC2001 (Body of knowledge)
- CC2008 (Interim report)
- CC2013 (Big tent)
Three models

- MIT: Introduction to computing required for all university students
- Stanford: Allow computer science students to specialize in other disciplines
- Bologna 3-2: core + specialization
Big tent view of computing

- Requires major overhaul of curriculum
- While still developing the core