The Mother of All Disciplines?

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Academia on 3 Continents
Singapore Universities

[Map showing locations of universities in Singapore]
National University of Singapore

✓ Founded in 1905 as a medical school
✓ Research-intensive beginning in the 1990s
✓ Tenure-track system in 2000
✓ 37,000 students
  (27,000 undergrad + 10,000 postgrad)
✓ Top-ranked in Asia
NUS and Globalization

“A leading global university centered in Asia, influencing the future”

✓ Many undergrads spend time overseas

NUS Overseas Colleges
University- and faculty-level internships
Student exchanges with many universities
NUS Faculties

Faculty of Arts and Social Sciences
Business School
School of Computing
Faculty of Dentistry
School of Design & Environment
Faculty of Engineering
Faculty of Law

Yong Loo Lin School of Medicine
Yong Siew Toh Conservatory of Music
Saw Swee Hock School of Public Health
Faculty of Science
Yale-NUS College
Lee Kuan Yew School of Public Policy
Duke-NUS Graduate Medical School
Singapore

University Scholars Program

NUS Graduate School for Integrative Sciences and Engineering
School of Computing

✓ Established in 1998 from Faculty of Science
✓ 2 Departments:
  * Computer Science
  * Information Systems
✓ 111 Academic Staff (Tenure-Track & Teaching Track)
✓ 115 Research Staff
✓ 1650 Undergraduate Students
✓ 180 Masters Students
✓ 370 PhD Students
✓ S$10 million+ in research income per annum

(and we’re hiring!)
#8 in the World

#1 in Asia
Constraints and Challenges

- Demographics
- Constraints from Ministry of Education
  Undergraduate population of international students is decreasing to 15% overall, 30% for SoC
- Unpopularity of computing among Singapore students
- Slowly emerging IT industry
- Slowly emerging entrepreneurial ecosystem
- Low priority of computing in strategic research funding
- Review processes for grant proposals
- No regional research funding body
A Golden Age for Computing

✓ Our field now underpins virtually every facet of human endeavor

✓ This creates tremendous opportunity for collaboration in research and education

✓ And the research collaborations need not be “service-oriented”
Example
Big Data Analytics for Healthcare

- Understanding and predicting disease in Singapore, by integrating modeling and analyzing a vast range of patient data
  - 90% of high school graduates are nearsighted
  - Average age of heart failure is 8 years younger in Singapore than in New Zealand
  - Diabetes among heart failure cases is 55% in Singapore vs 27% in New Zealand
  - 11.3% of Singaporeans have diabetes, growing to 1 million people by 2050
    *Obesity a major factor for Chinese and Malays but not for Indians*
Example
Modeling and Predicting Disease Propagation

- Exploitation of mobile devices for location tracking and for data management tasks

✓ Spread of dengue fever in Singapore
  Two-thirds of cases have unknown geographic origin

✓ Spread of MRSA in Singapore hospitals
  Singapore hospitals have a 5% conversion rate among inpatients
Making It Happen

• Cross-faculty special-interest groups
• Seed funding from faculties involved
• Seed funding from NUS ODPRT
• Strategic funding from MOE and NRF

Must be done *top-down and bottom-up*
The Ph.D Bust: America's Awful Market for Young Scientists—in 7 Charts

Perhaps it's time to start talking about a STEM surplus?

JORDAN WEISSMANN | FEB 20 2013, 2:23 PM ET

Politicians and businessmen are fond of talking about America's scientist shortage -- the dearth of engineering and lab talent that will inevitably leave us sputtering in the global economy.

But perhaps it's time they start talking about our scientist surplus instead.

I am by no means the first person to make this point. But I was compelled to try and illustrate it after reading a report from Inside Higher Ed on this weekend's gloomy gathering of the American Association for the Advancement of Science. In short, job prospects for young science Ph.D.'s haven't been looking so hot these last few years, not only in the life sciences, which have been weak for some time, but also in fields like engineering.

The graphs below, drawn from National Science Foundation data and some of my own calculations, depict Ph.D. employment at graduation. It's not a perfect