Computing Research and People with Disabilities

Maria Klawe

Harvey Mudd College

Outline

- Why it matters
- Learnings from a concussion
- Some research stories:
  - The Aphasia Project
  - Neurodiverse tech employees
  - Richard Ladner and his Ph.D. students
- Closing thoughts

Why it matters

- Creating a better world
- Increasing diversity in computing research
- Diverse perspectives produce more ideas

Learnings from a concussion

- Bicycle accident 1994
- Cognitive impact first 5 months
- Cognitive impact next 4.5 years
- Learnings:
  - Difficulty in asking for help
  - Stigma of disability
  - Impostor syndrome

The Aphasia Project

- Aphasia = loss of language
- Anita Borg Oct 2002, 7 months before death from brain cancer
  - Difficulty reading, writing, naming objects
  - No problem with numbers, images, maps
- UBC-Princeton research project
  - Create ESI (Enhanced with sound and image) mobile apps (e.g. planner, cookbook)
  - Participatory design with Anita
  - Researchers in HCI, psychology of aging, speech sciences

Some research examples 2003-06

- ESI Tablet cookbook and ESI planner
  - Usage studies in BC and NJ
  - Challenges:
    - Locating people with aphasia to participate
    - A universe of one
    - Ahead of mobile market (iPhone 2007, iPad 2010)
- Impact of aging on use of mobile technology
  - Initial use of a new app
  - Reducing errors in pen selection from menus

Neurodiverse Tech Employees

Meredith Ringel Morris (MSR), Andrew Begel (MSR), Ben Wiederman (HMC)

Assets 2015 best paper

- Neurodiverse = Autism Spectrum Disorder, ADHD, dyslexia
- Methodology:
  - Interview of 10 neurodiverse tech workers
  - Survey of 846 tech workers at Microsoft
    - Mostly software developers, testers
  - Microsoft and SAP have announced goal to employ more tech employees with ASD

Findings

- 59 with ASD, ADHD, dyslexia or multiple (7%)
- Most diagnosed as adults, most have not disclosed to HR
- Neurodiverse workers report greater problems with:
  - Open office space, social interactions, team meetings, politics
- Neurodiverse workers report being slightly:
  - better at detecting patterns in code, good coding style
  - worse at reviewing code, requesting code reviews, writing test cases, focusing on a specific task

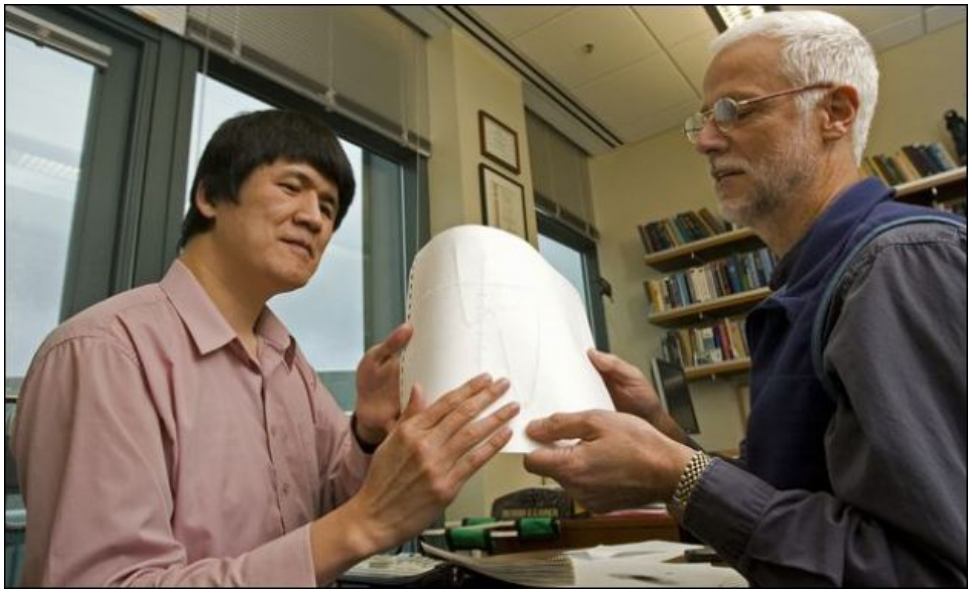
Richard Ladner and current Ph.D. Students

- **Kyle Rector**, Accessible Health Projects (co-supervised with Julie Kientz)
- **Sangyun Hahn**, Natural Language Processing and Machine Learning (co-supervised with Mari Ostendorf)
- **Lauren Milne**, MobileAccessibility Projects
- **Catherine Baker** , MobileAccessibility Projects
- **Danielle Bragg** , American Sign Language Technology Projects
- **Alex Fiannaca**, Input Accessibility (co-supervised with Maya Cakmak)

Four women, four NSF fellows, three with disabilities

Richard's former Ph.D.s working in accessibility

- CMU, Cornell Tech, U.C. Boulder
- Intel, Google, Qualcom, Thomson Reuters



Closing thoughts

- Big demand in academia and industry for researchers in accessibility
- Highly interdisciplinary research brings great opportunities and some challenges
- Any computing researcher can enter and contribute to this work

Discussion