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, Qualcomm, 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