Overview of the Human-Computer Interaction Institute
Jodi Forlizzi, Geschke Director
1 February 2018
Computing and communication technologies are changing our lives.
Data is the new oil
HCI is increasingly dealing with data
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Human-Computer Interaction is a field of study that focuses on the design, development, and study of computer technology in all aspects of life.
Poor HCI can lead to errors
Poor HCI can cause mania

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Poor HCI can be fatal
The Human-Computer Interaction Institute supports societal advance through the study, development, generation, and use of data.
Research areas

- Learning science
- Transformative games
- Social computing and computer-supported collaborative work
- Constructive design research
- 3D fabrication and its application
- Sensors and input devices
- User interface software tools
- Privacy and security
Learning science
Learning science & learning technologies

- Important: improving education is key to social progress
- Interesting: how do humans learn?
- Impactful:
  - 500K students using cognitive tutors have doubled their achievement
  - 2011 sale of Carnegie Learning for $75M
  - OLI college courses improve learning 2x
  - Educational games show students learn more using games in certain contexts
Learning technologies: Examples

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Learning technologies: Examples

Students & Tutor working on designing a power plant

Tutor discusses thermodynamics concepts and makes arguments for design alternatives.

Students share results and ideas in a common workspace

Submit for feedback

Give feedback to two peers

Read feedback & revise

Submit for grades

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Learning technologies: Examples

Lumilo
a real-time, mixed-reality classroom orchestration tool, being designed for and by K-12 teachers
Transformative games
Transformative games

- Important: people are easily transfixed by games
- Interesting: impactful to lower SES individuals, less motivated players learn more
- Impactful:
  - Transformative impact on beliefs and behaviors
  - Help female students more easily learn math and science concepts
  - Reduce bias, help develop empathy for others
Transformative games: Examples
Social computing and computer-supported collaborative work
Social computing and CSCW

• Important: online communities have been available since the 70s, even more prevalent today
• Interesting: larger-scale social systems and data yield new opportunities for study
• Impactful:
  • Great legacy in social computing
  • Historic study on the social impact of internet use
  • Over 5K citations
Social computing: Examples

Overall Survival

Number of Group Decorations

Proportion of groups alive

% surviving

Days since group creation

Days since creation

3 decorations
2 decorations
1 decoration
No decorations

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Social computing and assistive technology

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[Image of a smartphone and a group of children with a tablet and a map interface]
Constructive design research
Constructive design research

- Important: builds on HCI practices of user-centered design and participatory design
- Interesting: design research differentiates the HCII from other programs in the US
- Impactful:
  - CMU HCII put CDR on the map
  - Conferences and journals devoted to this type of research
  - Book on constructive design research
Constructive Design Research: Examples
3D fabrication, materials, and sensors
3D Fabrication, materials, sensors

- Important: new revolution with new technologies empowering millions
- Interesting: everyone can use these technologies, create new workforces, empower those with disabilities
- Impactful:
  - Recognized for innovation in hardware and software tools to develop this technology
  - Collaborations with MechE, BioE, and Robotics
3D Fabrication: Examples

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User interface software and hardware tools
User interface tools

• Important: Make programming and access to technology easier for growing numbers of experts and novices
• Interesting: Apply user-centered design approaches, rather than building technology first
• Impactful:
  • Make UI programming easier for designers, those with limitations, Blockchain programmers, and others
  • 100M users of startup technology
User interface tools: Examples

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Privacy and security
Privacy and security

• Important: Many neglect cybersecurity practices, roughly 1 billion accounts compromised last year

• Interesting: Americans lack trust in key institutions for keeping personal information safe

• Impactful:
  • Changed awareness of and behavior related to online privacy and security using tools and services we created
Privacy and security: Examples
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What our alumni say

“My degree turned me into a world-class employee and significantly increased my ability to get a job that maximized my potential.”

“It was amazing. The most intense period of my life. My colleagues are still close, ten years later.”

“I learned a lot about UI... enough to start a startup.”

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