

User Interfaces (UIs)

Part of application that allows

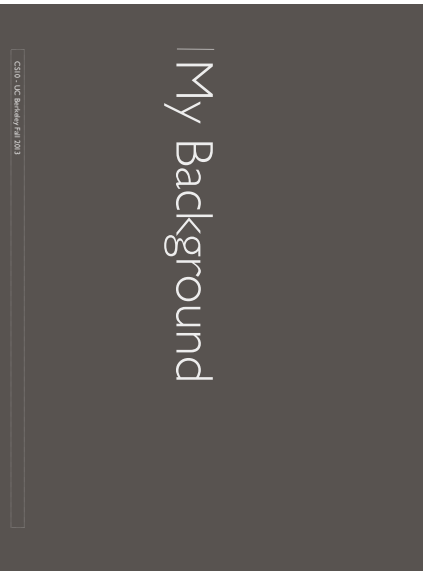
- People to interact with computer
- Computer to communicate results

Can include hardware design

- Buttons, sliders, other sensors

HCI = design, prototyping, implementation & evaluation of UIs

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Human-Computer Interaction (HCI)

Human

- End-user of program
- Others (friends, collaborators, coworkers)

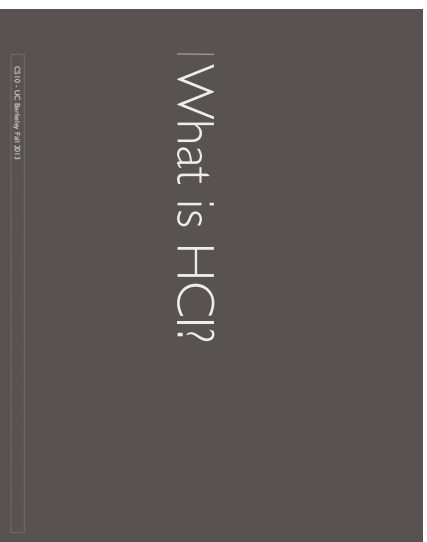
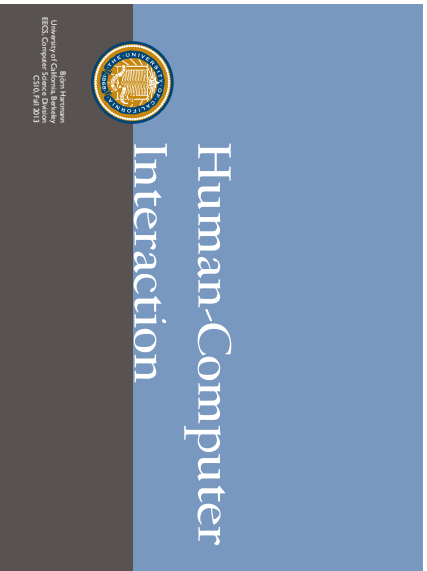
Computer

- Machine program runs on
- Often split: clients & servers

Interaction

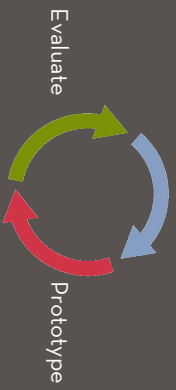
- User tells the computer what they want
- Computer communicates results

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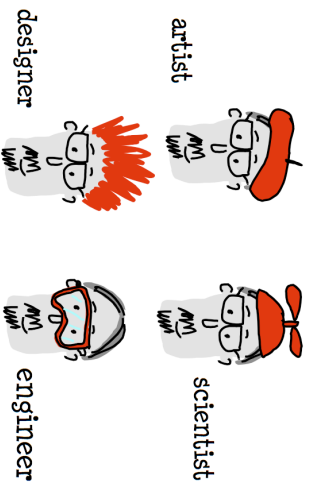
Iterative Design Cycle

Design



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Rich Gold, The Remade, MIT Press

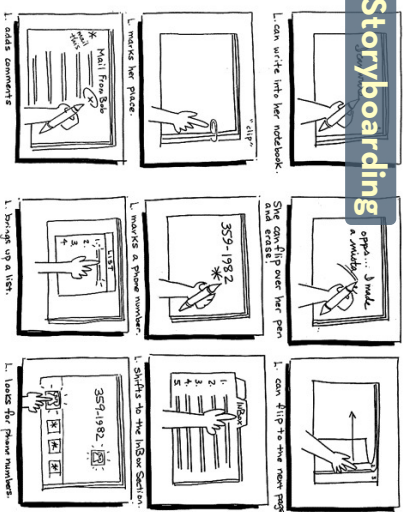
11

Design
Computer Science
Applied Psychology

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Storyboarding



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Prototyping Interfaces

Rapidly build a mockup of your UI
Low-fidelity techniques:
Paper prototyping
Video prototypes
Interactive prototypes:
HTML, Javascript, Flash, ...



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<http://www.washington.edu/learningcenter/learningcenter>

Understanding Users

Observe existing practices
Create scenarios of actual use
Build models to gain insight into work processes



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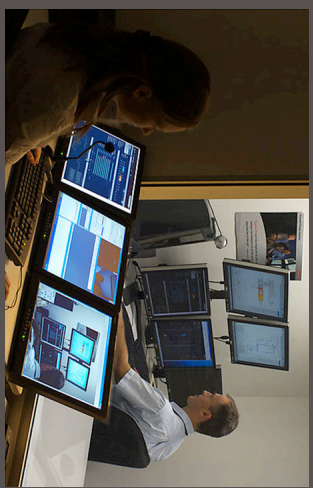
Evaluation

Formative
Are we building the right thing?
What should be different in the next iteration?

Summative
Does it work? Is it better than existing solutions?
Can this teach us something about how people or the world work?

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Techniques
Analytically expert walkthroughs, laboratory studies, ...

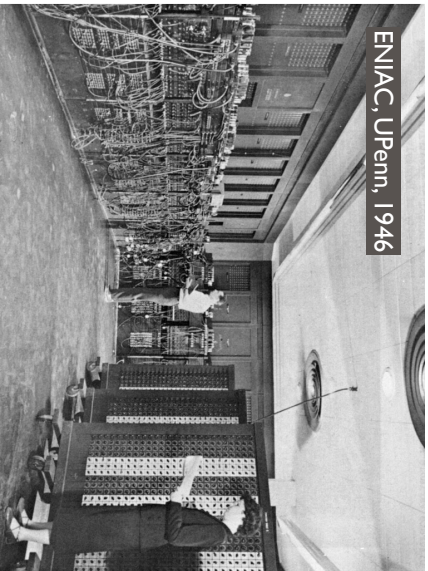
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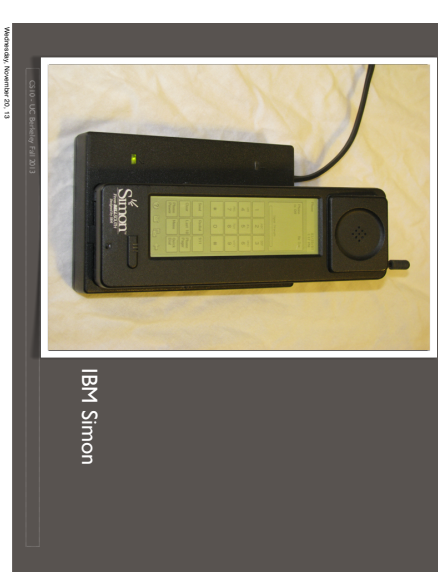
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History

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When was pen input invented?

- A. 1964
- B. 1973
- C. 1986
- D. 1995
- E. 2001



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Why study user interfaces?

How much of an application's source is devoted to user interface code?

- A. 10%
- B. 20%
- C. 35%
- D. 50%
- E. 75%

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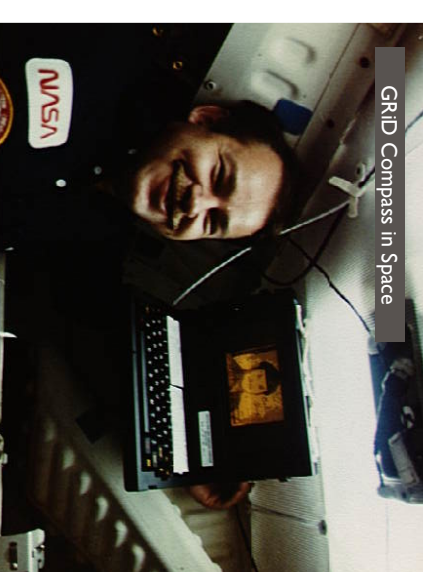
When was the mouse invented?

- A. 1948
- B. 1963
- C. 1978
- D. 1984
- E. 1991



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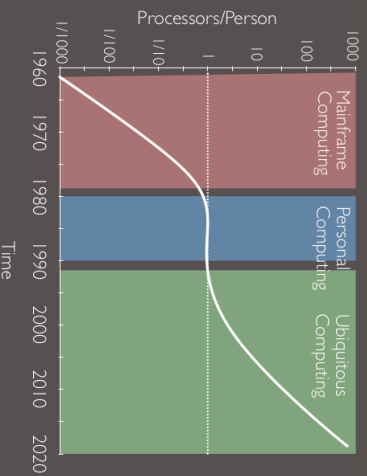
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Era	Ratio Computers:People	HCI Focus
Mainframe Computing	1:many	Human Factors
Personal Computing	1:1	Psychology, Cog-Science
Ubiquitous Computing	many:1	Collaboration, Rich Interaction

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What has changed?

“For every ant in the world today,
there are 100 transistors.”
- Gordon Moore, 2003

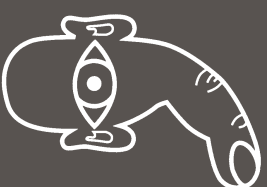
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(c) Dan O'Sullivan

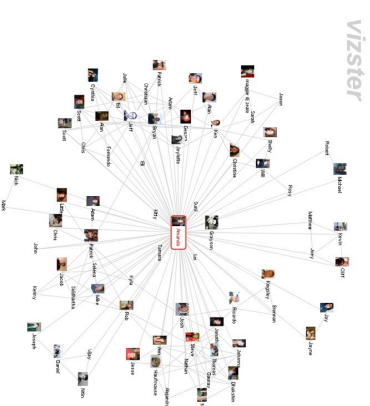
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Research Directions

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14

Air Guitar Hero

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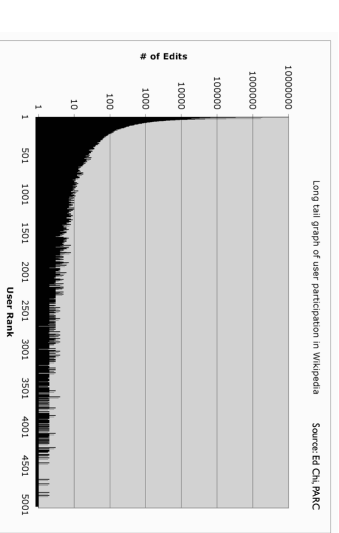
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Zipf / Power Law Distribution



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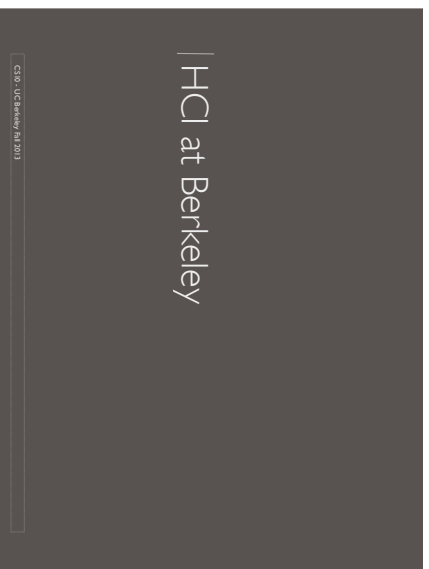
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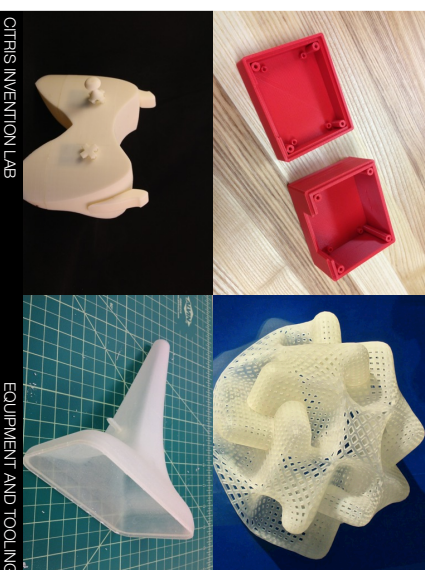
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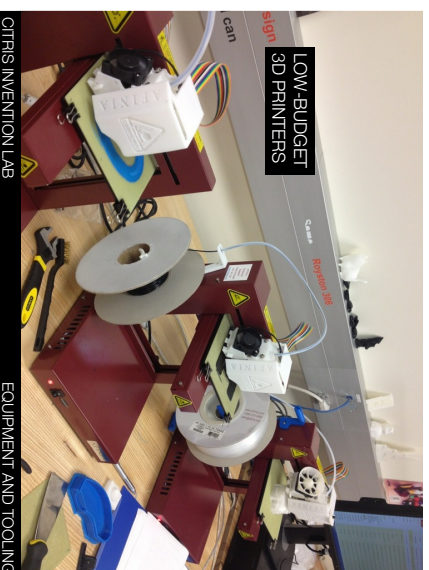
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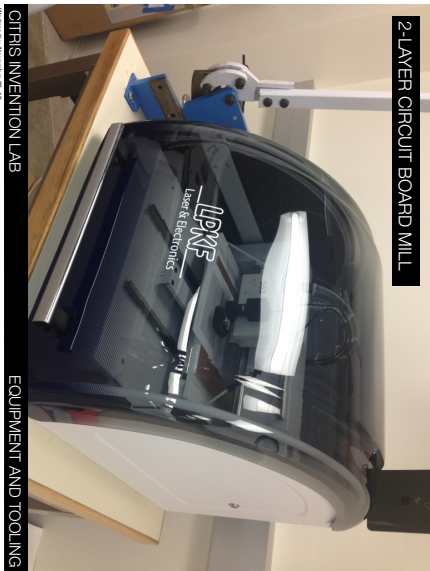
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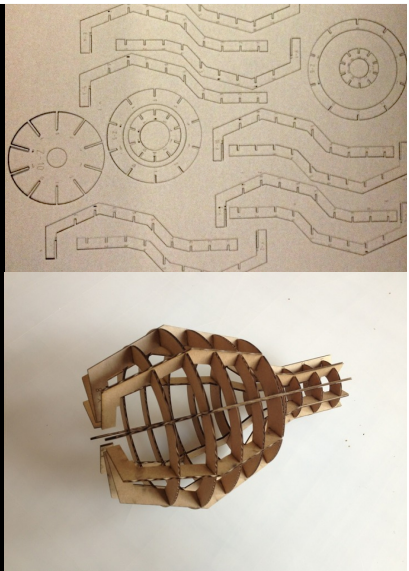
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2-LAYER CIRCUIT BOARD MILL

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EQUIPMENT AND TOOLING



LASER CUTTER

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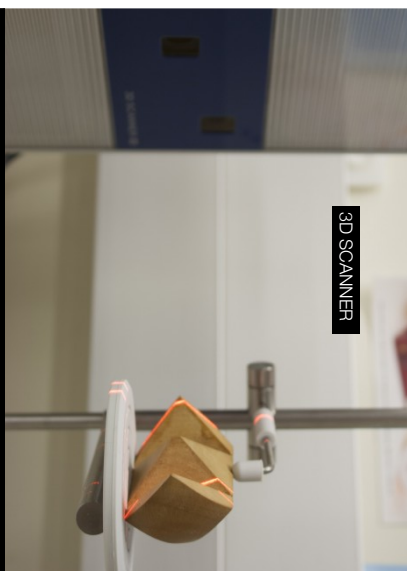
EQUIPMENT AND TOOLING



VINYL CUTTER

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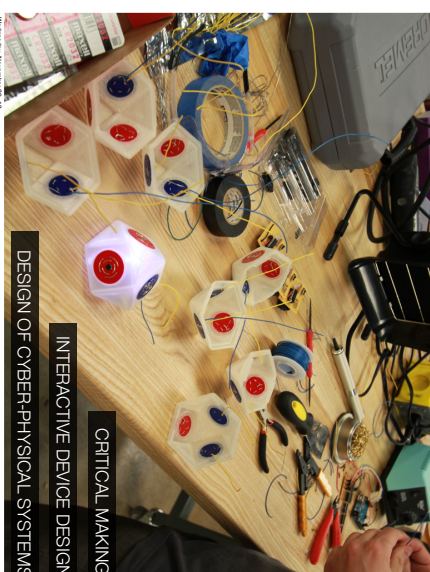
EQUIPMENT AND TOOLING



3D SCANNER

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EQUIPMENT AND TOOLING



CRITICAL MAKING
INTERACTIVE DEVICE DESIGN
DESIGN OF CYBER-PHYSICAL SYSTEMS

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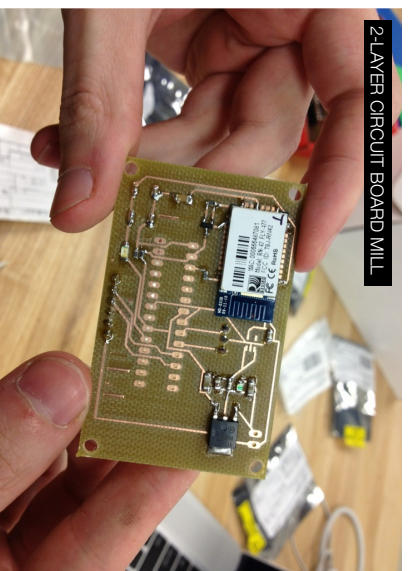
CITRIS INVENTION LAB



LASER CUTTER

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EQUIPMENT AND TOOLING



2-LAYER CIRCUIT BOARD MILL

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EQUIPMENT AND TOOLING

Instruction in the Invention Lab

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PART STORE

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EQUIPMENT AND TOOLING

DARK MAZE

Orhany cheng
Jonathan cotler
hurstal patel
cristi ivariu



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"This class was one of the most unique & rewarding classes I took at Berkeley. We actually learned how to make things! I personally think this class should be REQUIRED for all engineering students. I learned a lot, and had a lot of fun and made some awesome interdisciplinary friends."

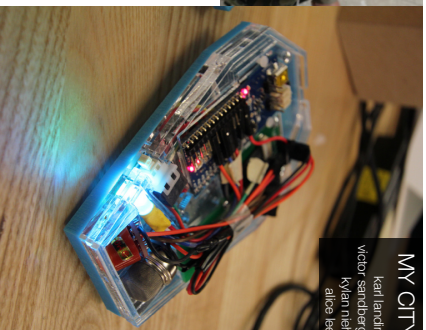
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SPICE PRINTER

Kylian meh
Victor sandberg
hurstal patel



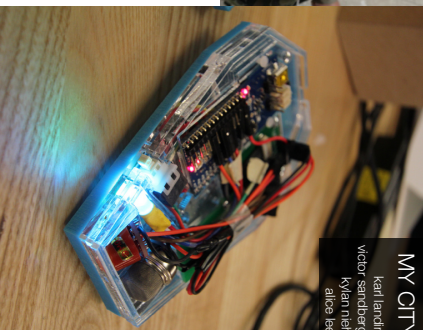
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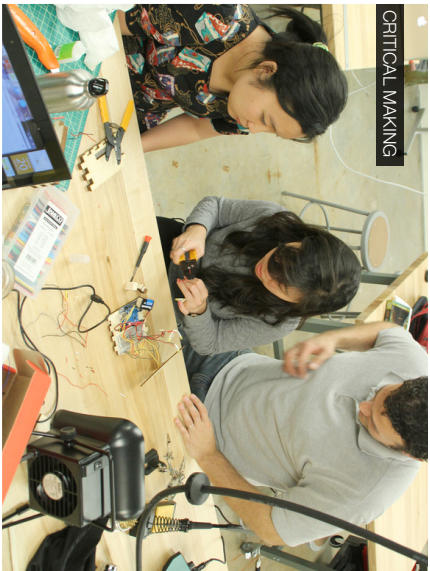
MY CITY

keith lochin
victor sandberg
kylian meh
alicia lee



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CRITICAL MAKING



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MOSSED UP

Jonathan cotler
noah plus



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DRINKIE SMART CUP

Amy Pavel
Steve Rubin
Eliot Nahrman
Sean Chen

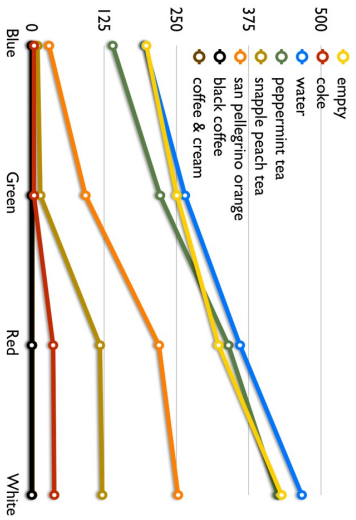


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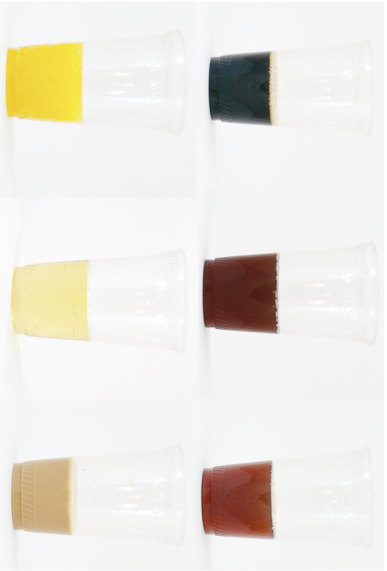
INTERACTIVE DEVICE DESIGN



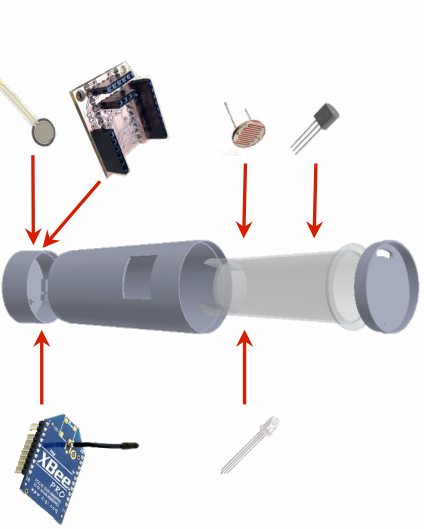
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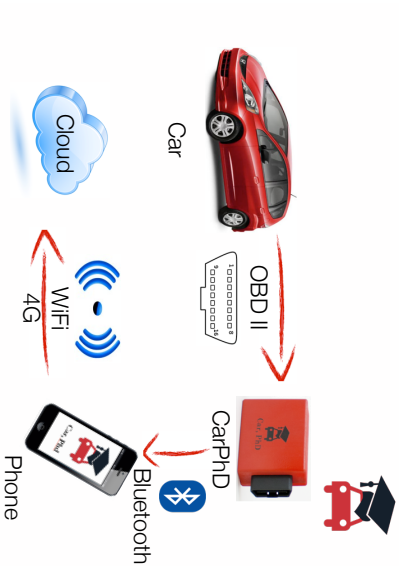
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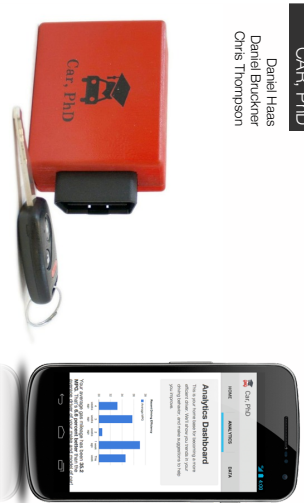


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CAR, PHD
Daniel Hase
Daniel Backner
Chris Thompson

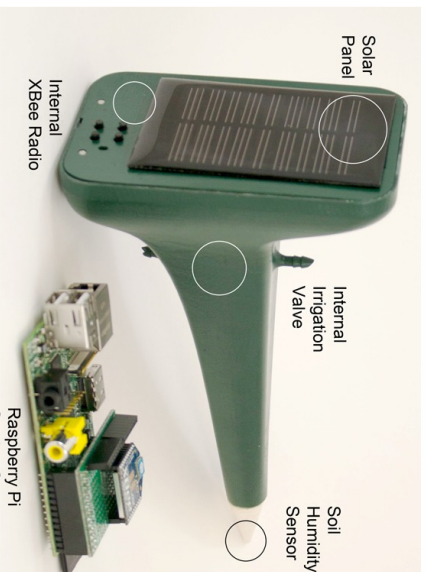


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Suan Chen,
Ben Zhang,
Claire Tuna



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H2O IQ
Drip Irrigation Controller
Valkyrie Savage
Shirly Gancsar
Mark Hugel



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Design Tools for Digital Fabrication

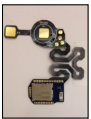
- Midas: Fabricating custom touch sensors
- Sauron: Vision-sensing of 3D printed prototypes

Expertise Sharing

- Fabbit: Threaded discussions for 3D models
- Democut: Mixed-initiative video editor for tutorials

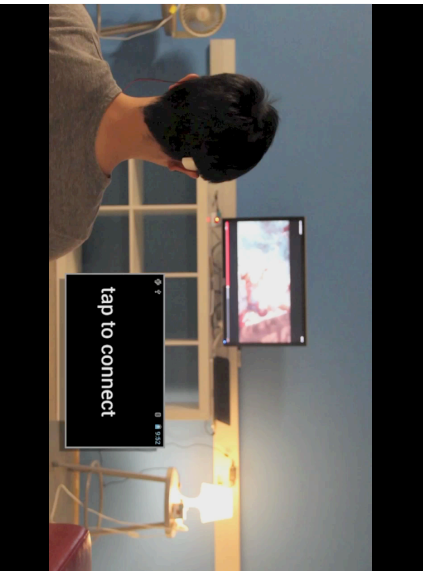
Software Platforms

- Fabryq: From sensor to server

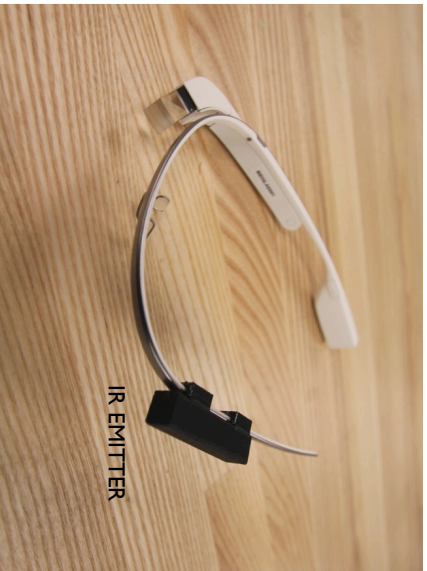


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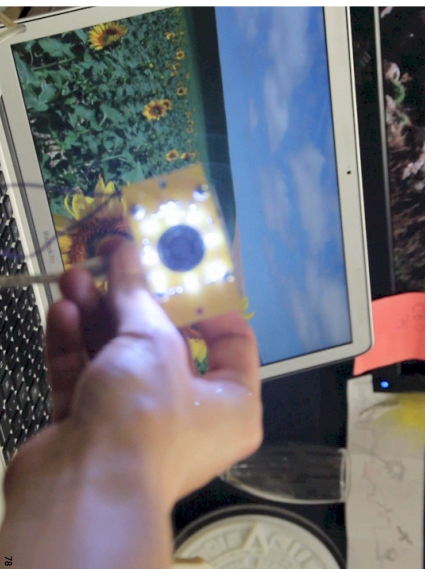
OUR RESEARCH



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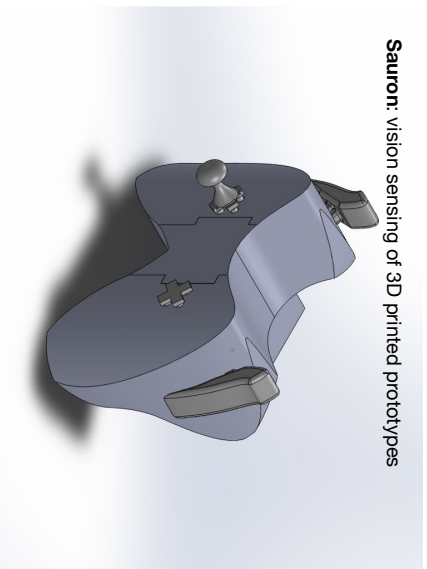
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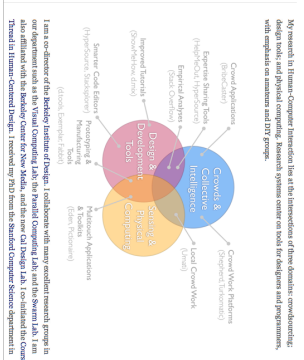
Sauron: vision sensing of 3D printed prototypes

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Bjoern Hartmann



Research in Human-Computer Interaction, User-Centered Design, and Learning. I design tools and physical computing. Research systems cover on- and off-line design and programming, with emphases on animation and 3D/VR projects.



I am a co-organizer of the Berkeley Institute of Design. I collaborate with many excellent research groups in the area of human-computer interaction, including the Center for Information Systems Research, the Center for Human-Computer Interaction, and the Center for Information Systems Research. I am also affiliated with the Berkeley Center for New Media, and the new Design Lab, a co-affiliated lab course. Thanked by Human-Centered Design, I received my PhD from the Stanford Computer Science department in 2004.

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Wednesday, November 20, 13



Wednesday, November 20, 13

79



bjorn@eecs.berkeley.edu
www.cs.berkeley.edu/~bjorn

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| Human-Computer Interaction Redux

...is concerned with the design, implementation, and evaluation of user interfaces.

Mobile, social & ubiquitous computing now is an incredibly exciting time to work in HCI!

Want more?

CS 160 User Interface Design

CS294-85 Critical Making

Course Thread in Human-Centered Design

<http://coursethreads.berkeley.edu>

CS160 UC Berkeley Fall 2013

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