Human-Computer Interaction IS4300

Prof. Timothy Bickmore

P7 – Heuristic Evaluation & Prototype Revision – DUE

- After you receive 7-8 heuristic evaluations…
- Assign each of these problems your own severity rating (cosmetic, minor, major, catastrophic)
- Modify your system to correct as many of the problems found as possible (in priority order), documenting how you do this.
- **What to Post** A link to your updated prototype and a report describing how you responded to the heuristic evaluations.

P8 – Finish Project & Do User Testing – Due 12/9

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  - 3+ users, 3+ tasks
  - Briefing
  - Can demo system on additional task first
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  - Semi-structured interview
- Redesign
  - Sort severity problems by severity
  - Describe how you would address as many as possible
- Document everything in usability.gov brief usability test report.

Ubicomp

- Ubiquitous Computing, aka
- Pervasive Computing

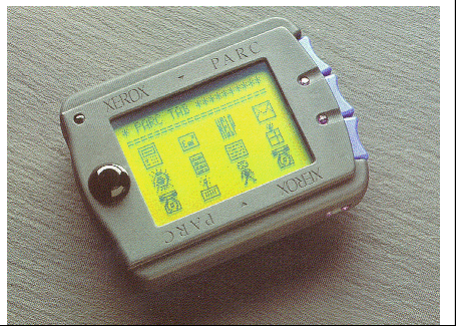
- "Computing off the desktop"
- Mark Weiser @ Xerox PARC 1990's

Ubicomp

- Anticipates when computing and communication technologies disappear into the fabric of the world.
- HCI that is concerned with many computing devices interacting with many others.

Xerox PARC Projects

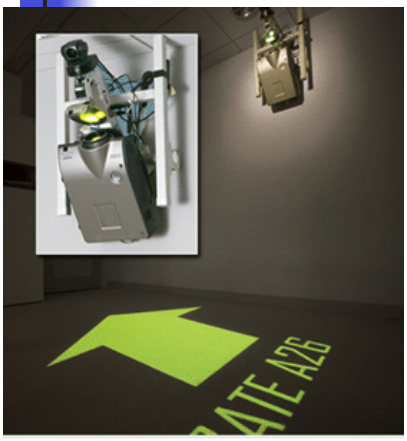
- PARCtab (’90s)
  - Location sensitive mobile computing
  - IR communication with each room

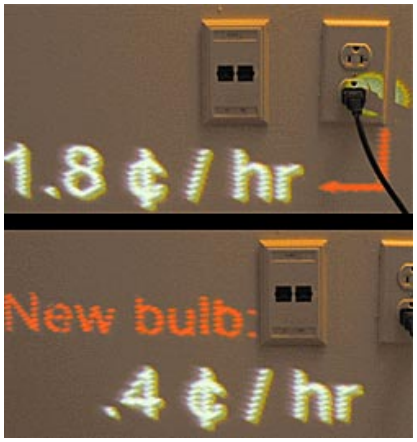


Ubicomp environment sensing e.g., Full body interaction

- Concerns the wide range of techniques that can be used to track body movement in a space and how those movements can be interpreted.
- Many games and home entertainment systems make some use of body movement.
  - Wii, Kinect
- More sophisticated system require a whole room to be equipped with sensors and tracking devices so that complex movements such as dance can be monitored and used as input.

ubicomp environment displays IBM Anywhere Display

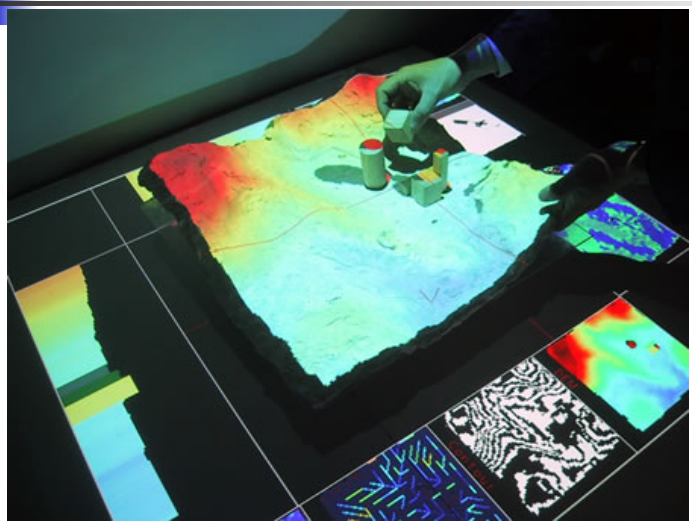




Ambient Interfaces: Ambient Orb

Ambientdevices.com

Blending physical & digital e.g., tangible interfaces



Information Space

- In physically distributed ubicomp environments information and interaction is distributed through physical space.
- The physical architecture of an environment will affect the interaction as will the existence of signs, furniture and other people.
- Three types of object of concern in information spaces;
  - agents,
  - devices
  - information artifacts.

Information Space

- Examples?
- Design issues?
- How would you design an information space?

Info Space
e.g., home a/v

Info Space
e.g. science museum

Info Space
e.g., Command & Control

Info Space
e.g. kitchen of the future

Ubicomp Design Issues
Benyon

- Ontology – objects & concepts
- Topology – physical layout
- Volatility – information change
- Media - modalities
- Agency – other people

Other ubicomp issues?

- Distribution of information across devices
  - One large display vs. Many small ones
- How do we signal what systems and services exist (as they become invisible)?
  - Seamless vs. “Seamed”
- Privacy
  - Sensed data
  - Displayed data

Design approach
Benyon

1. Conceptualize overall experience
2. Determine activities
3. Determine content & r' ship with space
   - Transitions, awareness, narratives
4. Design of digital & physical space
   - UI, social interactions, flow, etc.

How do our models of interaction need to change for ubicomp?

- Model Human Processor / Norman's Interaction Model, Assumes:
  - single user
  - uninterrupted task
  - state either on screen or in working memory
- Alternate theoretical frameworks
  - Activity theory, Distributed cognition, Ethnography

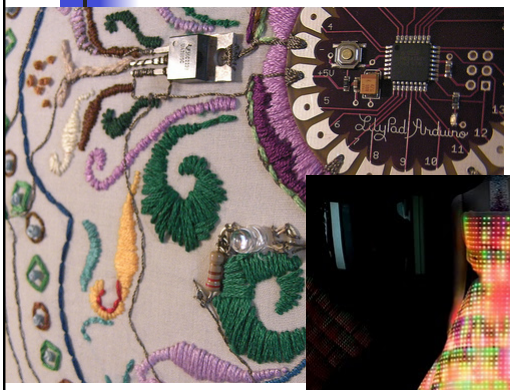
Wearable Computing

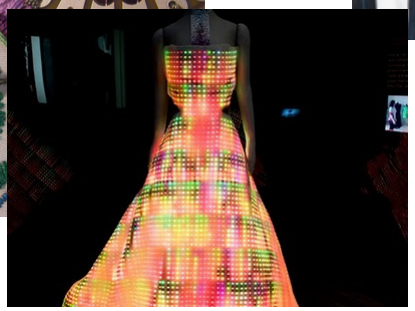
The goal of wearable computing is to position or contextualize the computer in such a way that the human and computer are inextricably intertwined – S. Mann

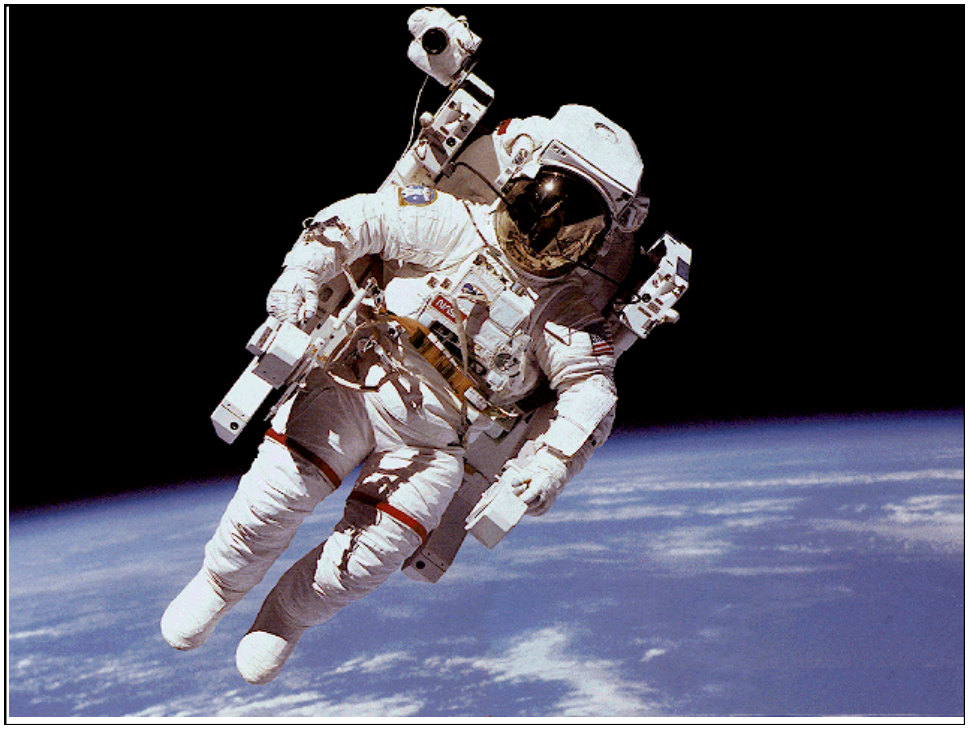
Affective Computing Group

Prof. Rosalind Picard

Digital Clothing







Prosthetics

Implantables

Implantables

Mainstream Wearables

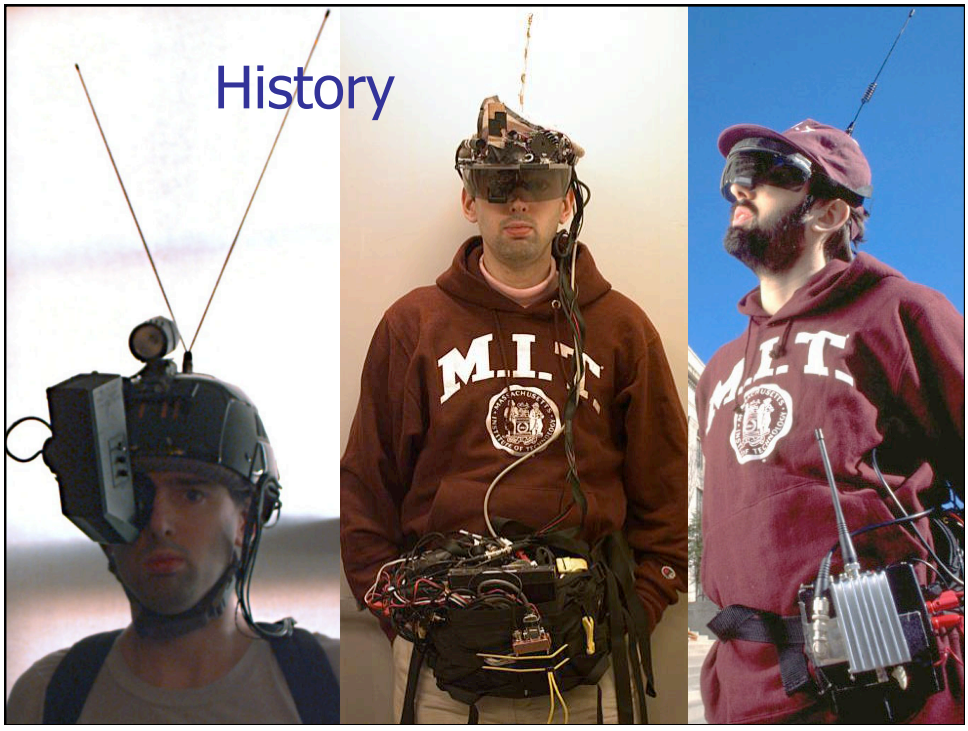
Wearables Chapter
Steve Mann

- Advantages?
- Constancy of interaction
- Supports multi-tasking
- An extension of the user
- Humanistic Intelligence
  - the computer as a second brain
  - sensory modalities as additional senses
  - "Sixth sense"

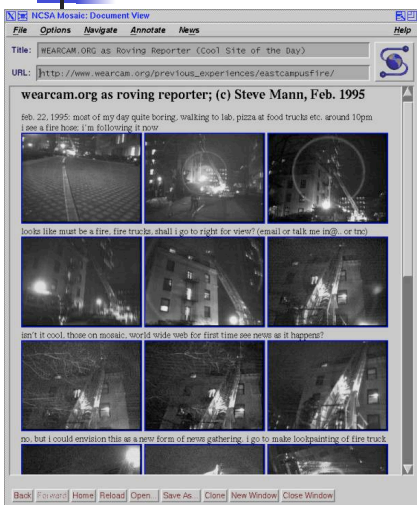
Augmented Reality

Augmented Reality

History



lifeglogging, cyborGLOGGING, glogging, lifelogging, lifecasting, or sousveillance



The future?

Here, now

UCAMP design framework - *Siewiorek*

- **User:** The user is at the center of the wearable-computer design process.
- **Corporal:** Wearables should be designed to interface physically with the user without discomfort or distraction.
- **Attention:** Interfaces should be designed for the user's divided attention between the physical and virtual worlds.
- **Manipulation:** When mobile, users lose some of the dexterity assumed by desktop interfaces. Thus, controls should be quick to find and simple to manipulate.
- **Perception:** A user's ability to perceive displays, both visual and audio, is also reduced when using a mobile device. Displays should be simple, distinct, and quick to navigate.

Unique concerns for wearables

- Comfort
  - Weight, fit, heat, noise, vibration
- Aesthetics
  - Would users want to be seen with it?

Exercise

- Project teams
- Design a version of your project (or extension) for Google Glass
  - How do you take advantage of its unique affordances?
  - How is your design different from a desktop app?
  - How is your design different than a smart phone app?

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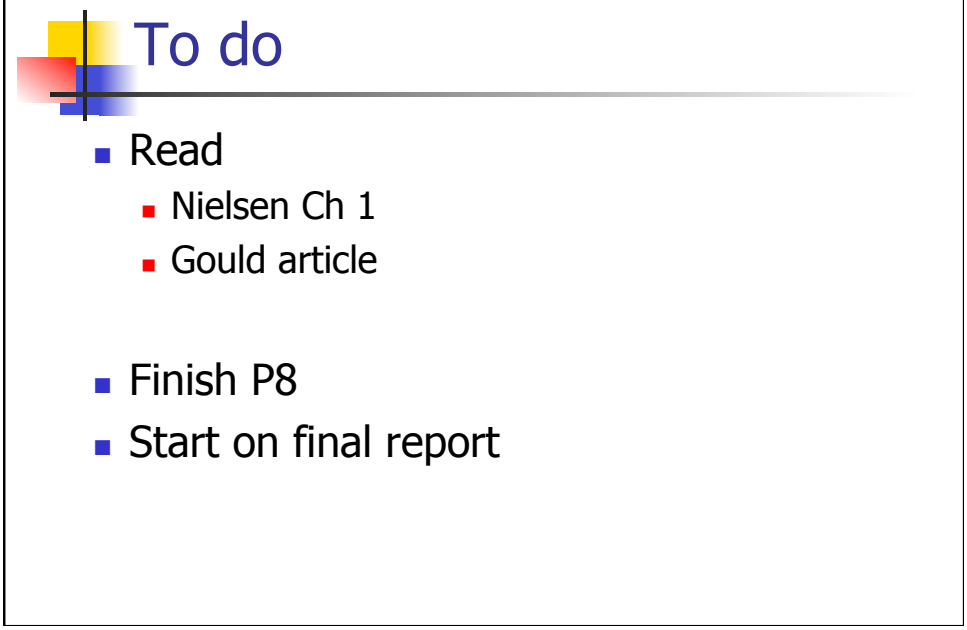
To do
Read
Nielsen Ch 1
Gould article
Finish P8
Start on final report