User Interaction: Ubiquitous Computing

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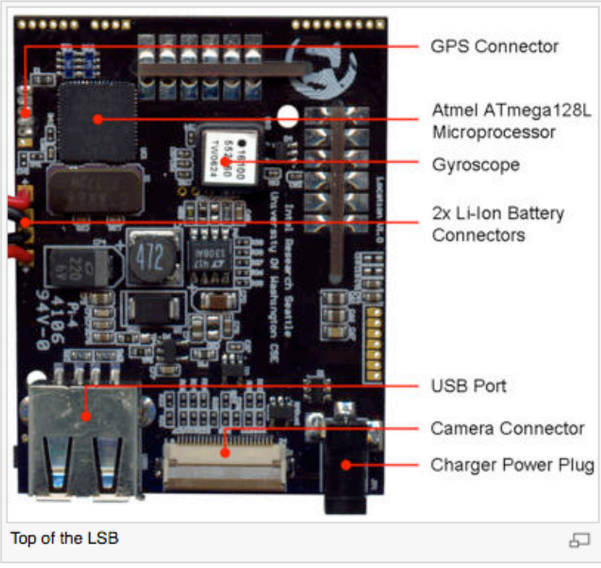
Technology: Redefining the Interaction Experience

- Implicit input
  - Sensor-based input
  - Extends traditional explicit input (e.g., keyboard and mouse)
  - Towards “awareness”
  - Use of recognition technologies
  - Introduces ambiguity because recognizers are not perfect
    - Probabilistic interaction is a new paradigm

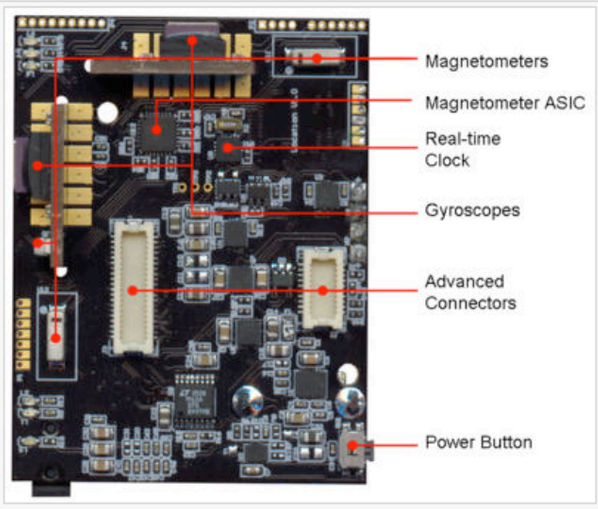
Technology: Different inputs

- Large-Screen Touch
  - MS Surface
    - http://www.metacafe.com/watch/618189/microsoft_surface_computing_the_power/
    - http://www.youtube.com/watch?v=CZrr7AZ9nCY

Overview Images



Top of the LSB



Bottom of the LSB

Proximity range sensor:

Infrared (IR) receiver

IR emitter (below receiver to right)

Touch sensitivity:

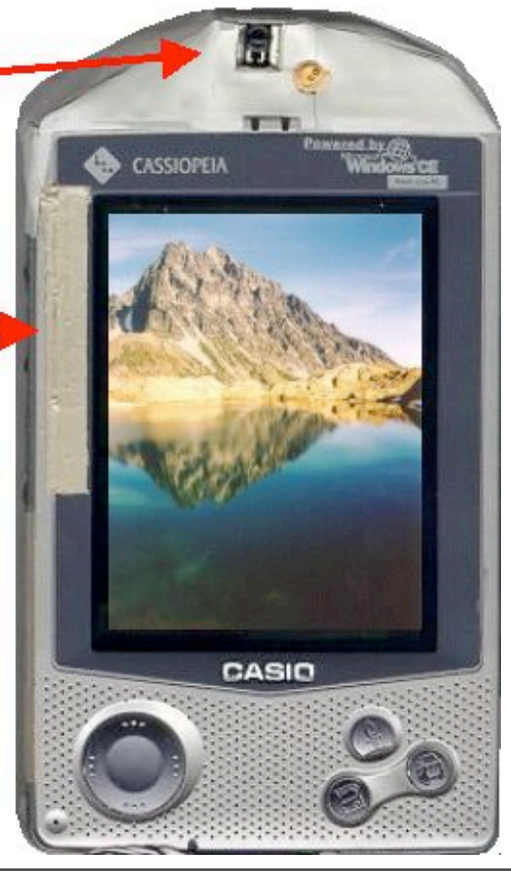
Screen bezel

On sides & back of device

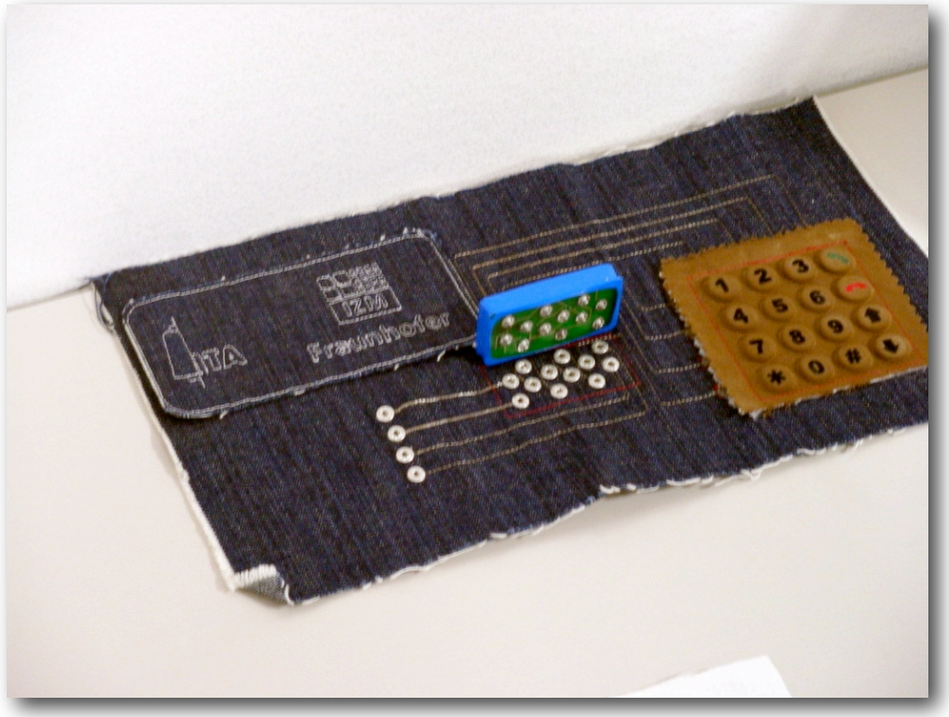
Tilt sensor:

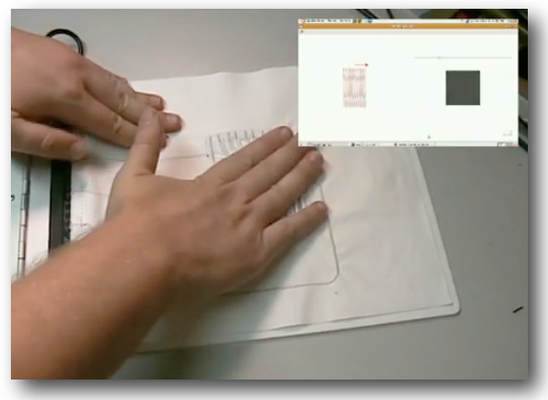
Inside device, in plane of the display

2-axis linear accelerometer



Technology: Different inputs





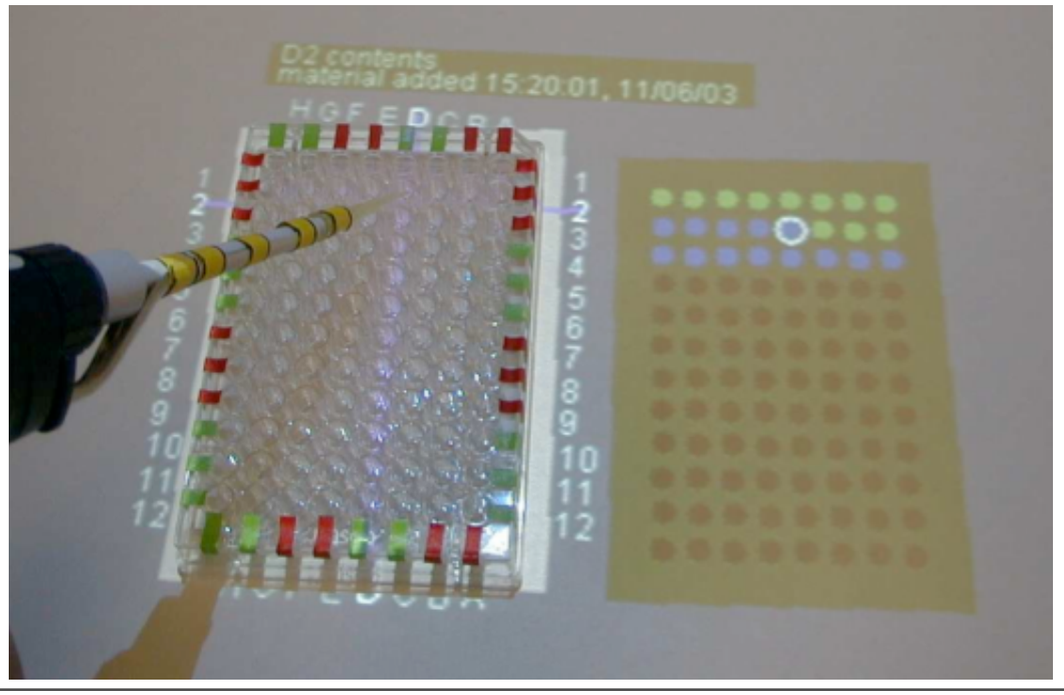
- Textile Interface Swatchbook
  - http://www.youtube.com/watch?v=NKWWa6BvUts
  - http://www.youtube.com/watch?v=Valtk6pXiHY

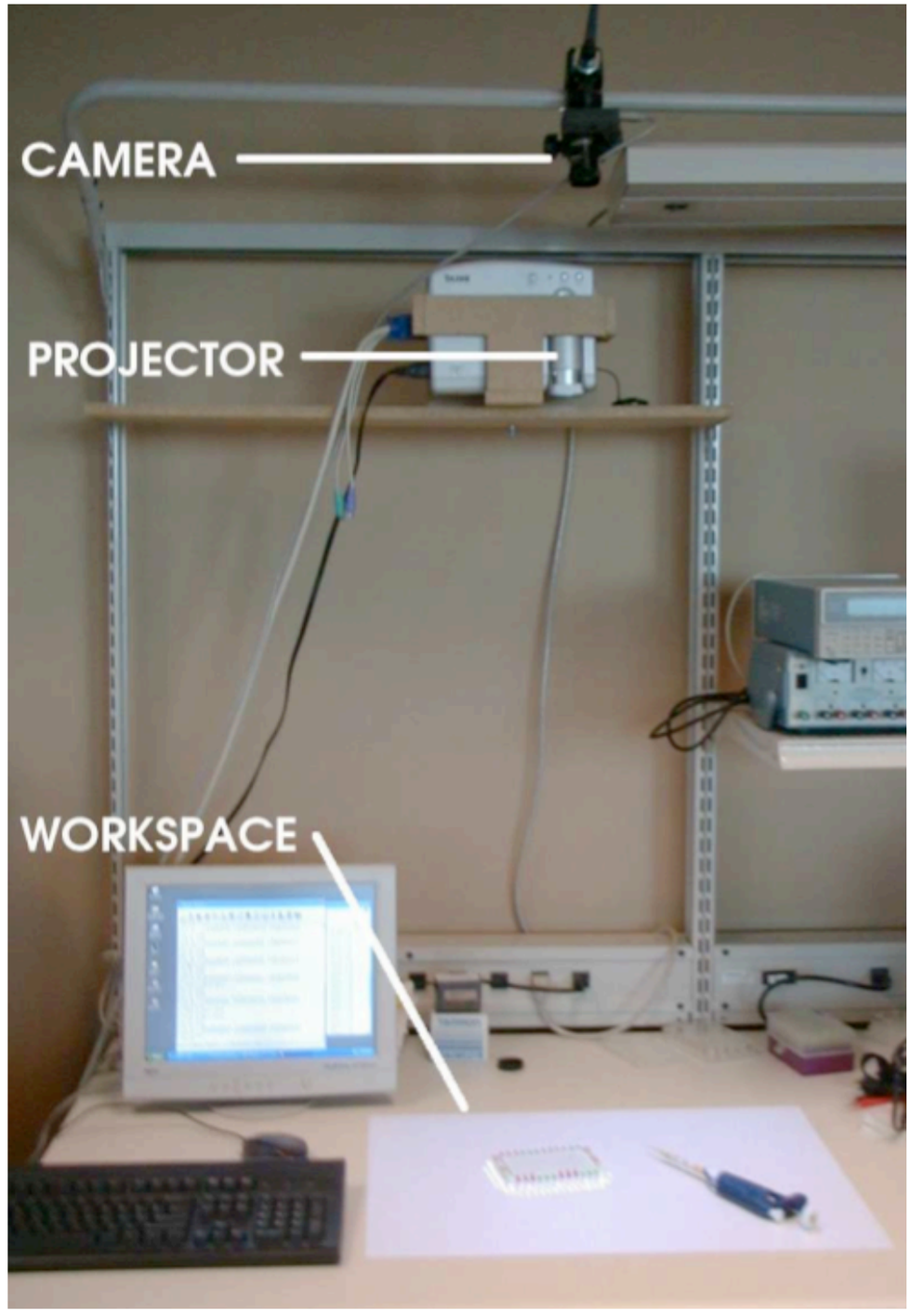
Technology: Different outputs

- More than eye-grabbing raster displays
  - Ambient: use features of the physical environment to signal information
  - Peripheral: designed to be in the background
- Examples:
  - Dangling String
  - Osaka Ferris Wheel

Technology: Merging Physical and Digital Worlds

- How can we remove the barrier?
  - Actions on physical objects have meaning electronically, and vice versa
  - Output from electronic world superimposed on physical world

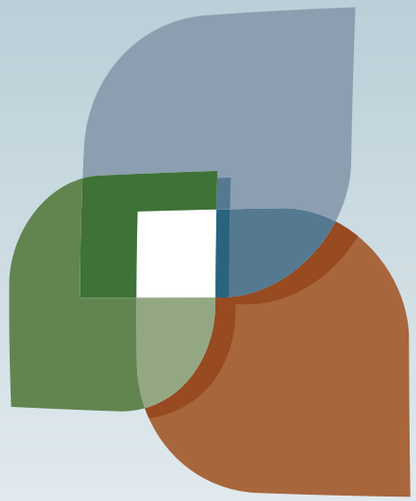




Microbiology Tray and Pipette Tracking as a Proactive Tangible User Interface, Hile et.al.

Application Themes

- Context-aware computing
  - Sensed phenomena facilitate easier interaction
- Automated capture and access
  - Live experiences stored for future access
- Toward continuous interaction
  - Everyday activities have no clear begin-end conditions



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