

# Mobile Devices

CMSC 434

Intro to HCI

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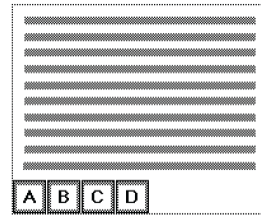
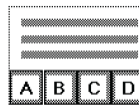
## Why Mobile Devices Matter

- Phones : PCs sold in 2008?  
(10: 1)
- 2X more mobiles than landlines (2007)  
(2.7 B vs. 1.3 B)
- 2x more SMS-ers than emailers (2007)  
(1.8 B vs. 800 M)
- In 2007, more users will access the internet via phone than PC

## Key Challenges

- Limited I/O
- Limited resources  
(CPU, memory, battery, bandwidth)
- Diversified context of use
- Different activities
- Limited attention

by 100!



## Wide Range of Forms & Styles



## Diversified Context of Use



- More room for specialized interaction



## Different Activities

- Activities are different
- Not just in different places



## Limited Attention

- Mobile scenarios vie for our resources
  - Mental
  - Physical



10% drive while phoning

## Personal

- We don't share our phones much  
(even among family)
- 7/10 people sleep with their phones [Nokia]



# Affordances

## Easy to hold in one hand

- Leaves other hand for manipulation

## Easy to carry

- Lightweight
- Small
- Rotate, squeeze, drop, etc.

## Speech input

- Primary use of phone

## Alphanumeric input (NOT)

## Other Input

- Buttons, dials, etc.
- Touchscreen

## Small screen/Varying resolution

- Can only show most important information
- Higher resolution make some tasks easier (reading, ...) iPhone (163 dpi)

## Wide range of prices

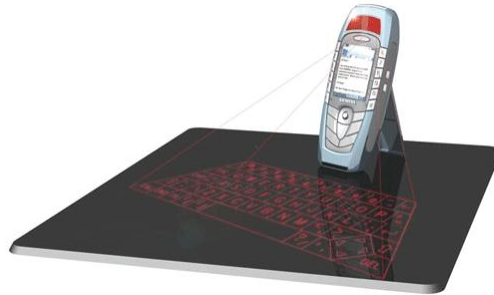
- Cheap phones treated as throwaways
- Expensive phones handled with care

## Alphanumeric Input

The collage illustrates various alphanumeric input methods on mobile devices. It includes:

- A Nokia slider phone with a physical QWERTY keyboard.
- An iPhone with a virtual QWERTY keyboard.
- A Palm Treo with a full QWERTY keyboard.
- A diagram showing a grid of letters with red lines indicating a path for a stylus.
- A diagram showing a grid of letters with numbers above them, representing a numeric keypad layout.
- A small diagram showing a grid of letters with numbers above them, representing a numeric keypad layout.

# Alphanumeric Input



[www.lumio.com](http://www.lumio.com)

# Selection



D-Pad



Dial



Touch screen  
- resistive  
- capacitive

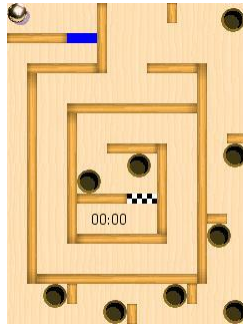


Roller ball

## Other Sensing



QR Code

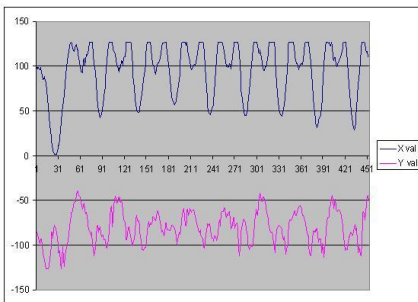


Accelerometer

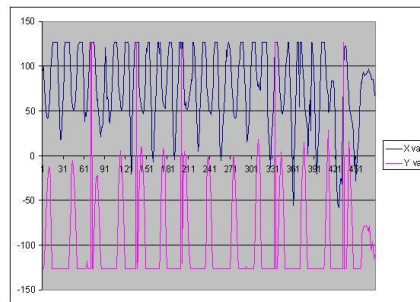


Back of device

## Context Detection



Walking



Running

[From Cavis & Cortez – 2008]

## Small Display

The plasma membrane is the edge of life, the boundary that separates the living cell from the nonliving surroundings.

The plasma membrane is the edge of life, the boundary that separates the living cell from the nonliving surroundings.

plasma membrane edge of life, boundary separates nonliving.

plasma membrane edge of life, boundary separates nonliving.

plasma edge

Automatic Text Reduction  
[Baudisch et al., 2002]



Summary Thumbnails  
[Lam et al., 2005]

## Resources

<http://mobilewebbook.com/>

<http://www.sitepoint.com/article/designing-for-mobile-web/>

<http://www.smashingmagazine.com/2009/01/13/mobile-web-design-trends-2009>