
PDA

Lecture

Introduction, mobile computing (definitions and limits)



Lecture topics

■ Design principles

- Usage of the screen space
- User interaction
- Design generally
- Exploiting context

■ Development

- MS Windows Phone 7, Windows 8
- Google Android
- Apple iOS

■ Mobile technologies

- wireless communication (WiFi, Bluetooth, GPS, GSM)
- special interaction methods (accelerometers, vibrations, compass, flashing parts of mobile, touch gestures)

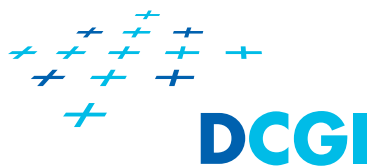


M. Jones, G. Marsden: Mobile Interaction Design



Mobile computing

- Aspects of mobility
 - user mobility
 - device portability



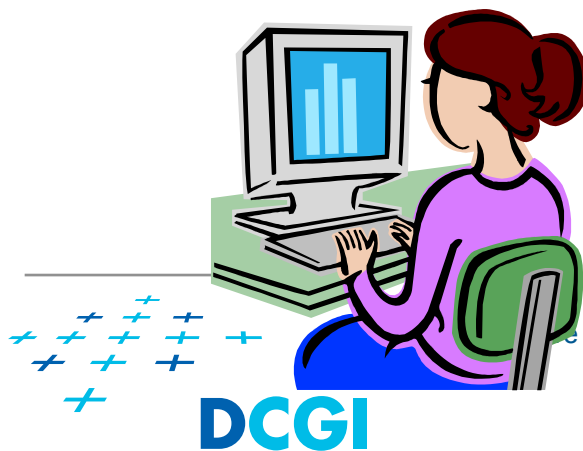
Mobile environment

Typical environment

- stationary position
- large display
- variety of input devices
- low noise level
- stable lighting condition
- user with no special needs
- does not change in time

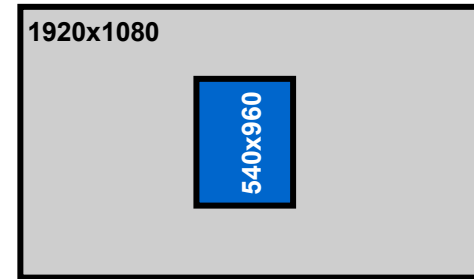
Mobile environment

- changing position
- small display
- limited input devices
- higher noise level
- unstable lighting condition
- user with special needs
- changes very dynamically



Inherent characteristics of UI on mobile devices

- Small screen
 - the biggest smartphones have 8x smaller screen than typical desktop monitors
- Limited interaction mechanisms
 - small/limited/missing keyboard
 - no mouse cursor
 - limited/missing direct pointing
- Unreliable and slower network connection
 - frequent interruption
 - big latency
 - low bitrate



1366x768 (25%)

1034x769 (13%)

320x480 (16%)



Huge variety on the mobile market

■ Type of devices

- sub-notebooks
- TabletPC
- PDA
- smart phone
- mobile phone
- pager
- sensors

■ Platforms

- Android (NA 40%, Europe 48% *)
- iOS (NA 50%, Europe 38% *)
- Windows Phone (NA 2%, Europe 3% *)
- BlackBerry OS (NA 5%, Europe 4% *)
- others

* <http://gs.statcounter.com>

Spring 2013

- Android (NA 38%, Europe 45% *)
- iOS (NA 52%, Europe 40% *)
- Windows Phone (NA 1%, Europe 2% *)
- BlackBerry OS (NA 2%, Europe 4% *)
- others

* <http://gs.statcounter.com>



Wireless communication

- Higher loss rate (interference)
- Unreliable
- Varying and higher delay
- Lower transmission rate
- Lower security



What does it mean mobile for the UI design?

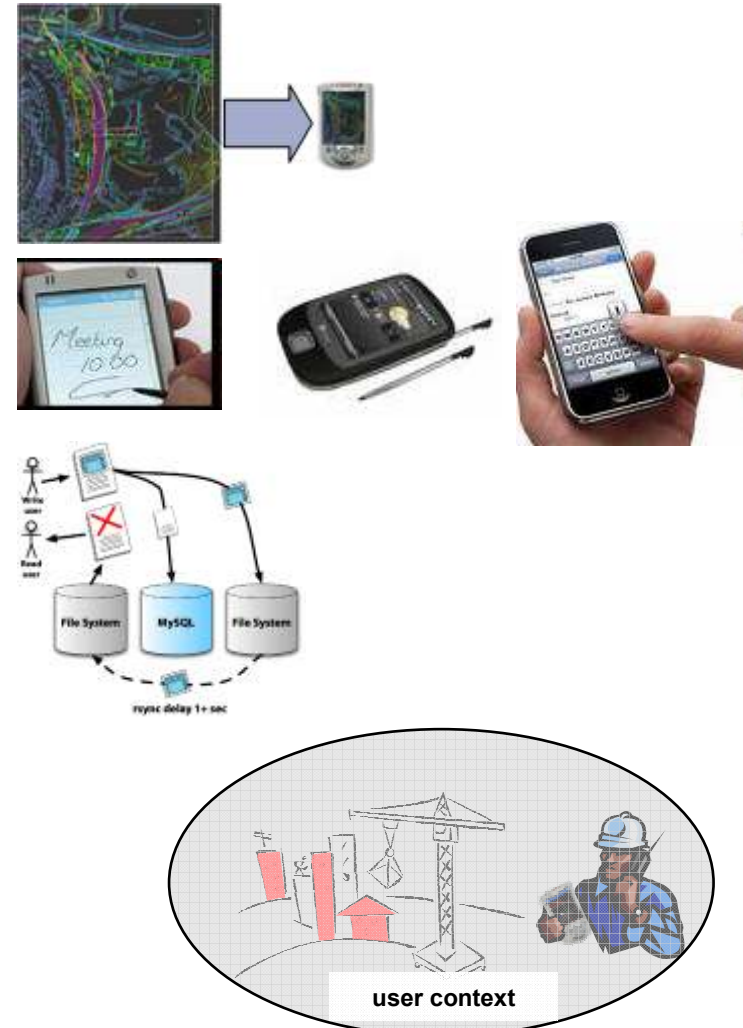
DYNAMIC VIEW

- User must handle frequent and unexpected interruption
- User focuses outside the device
 - car navigation
 - construction site management
- Switching between online/offline mode
- Input capabilities varies during work on the task
 - user (noise, gloves, etc.)
 - device (changing/configurable devices)



Main design problems of mobile UI

1. Usage of the screen space
 - 1a. Small screen space
 - 1b. Flexible user interfaces
2. User interaction
 - 2a. Handling the user input
 - 2b. Direct pointing (stylus/hand)
3. Design generally
 - 3a. Guidelines
 - 3b. Strange behavior
4. Exploiting context
 - 4a. frequent changes
 - 4b. variety of parameters
 - 4c. context driven UI



Main design problems of mobile UI

1. Usage of the screen space

- 1a. Small screen space
- 1b. Flexible user interfaces

2. User interaction

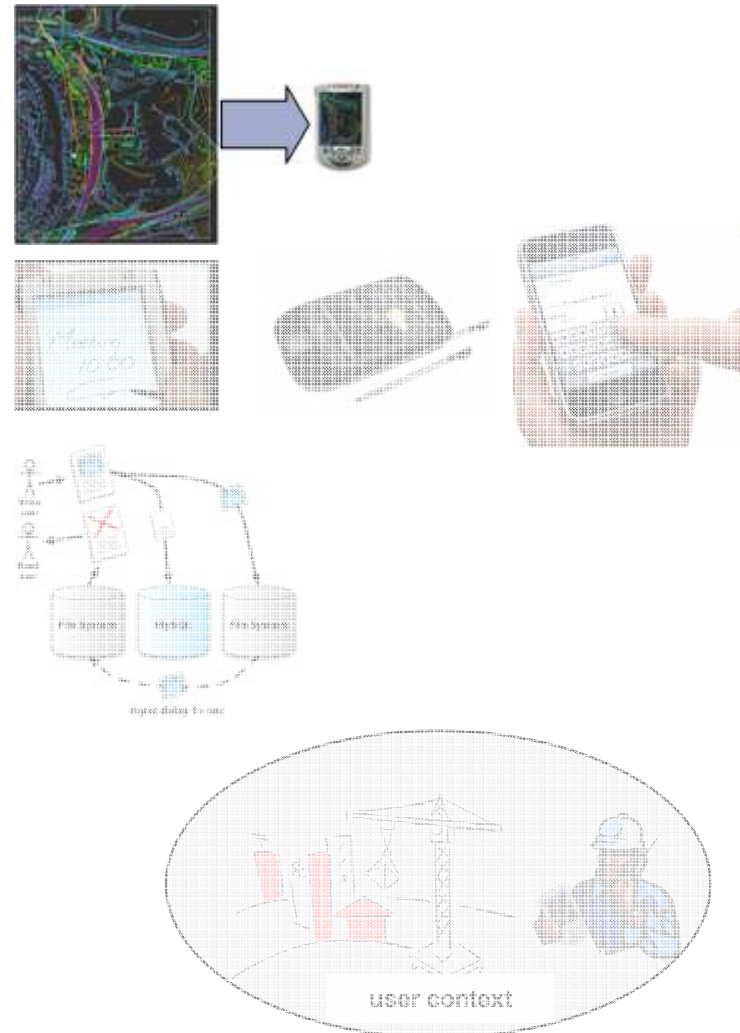
- 2a. Handling the user input
- 2b. Direct pointing (stylus/hand)

3. Design generally

- 3a. Guidelines
- 3b. Strange behavior

4. Exploiting context

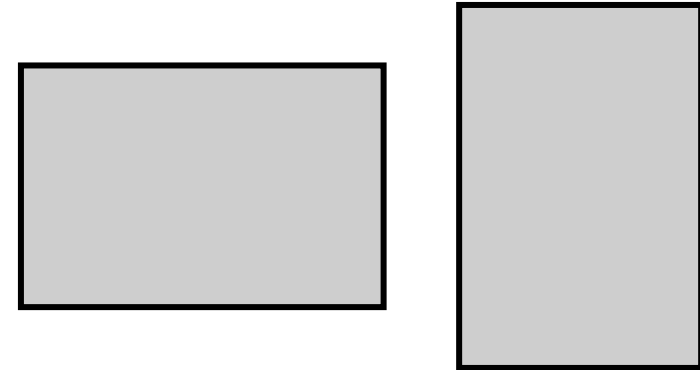
- 4a. frequent changes
- 4b. variety of parameters
- 4c. context driven UI



1a. Usage of the screen space – small screens

■ What is better orientation of the screen?

- portrait vs. landscape
- human way of remembering things
 - short-term memory



■ Why is bigger screen better than smaller?

- 320x480 (World 16%, Europe 27% *)
- 320x567 (Europe 11%)
- 480x800 (World 6%, Europe 10% *)
- 720x1280 (Europe 8%)
- 800x600 (World 4%)

* <http://gs.statcounter.com>

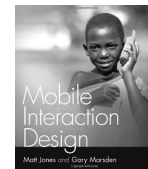
- user efficiency vs. user preference

320x480 (World 20%, Europe 31% *)
480x800 (World 5%, Europe 8% *)

* <http://gs.statcounter.com> Spring 2013

■ What about the comparison?

- browsing vs. direct actions



Ch 9.2



Thank you for attention

