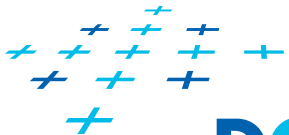

PDA

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

Student definition of mobile app:

1. usable on “the route”
2. for easy carrying devices
3. should be small and handy

■ Aspects of mobility

- user mobility
- device portability

wireless	mobile	example
x	x	PC in the office
OK	x	wireless LAN in historical building
x	OK	notebook in a hotel (connected to LAN)
OK	OK	PDA on the construction site



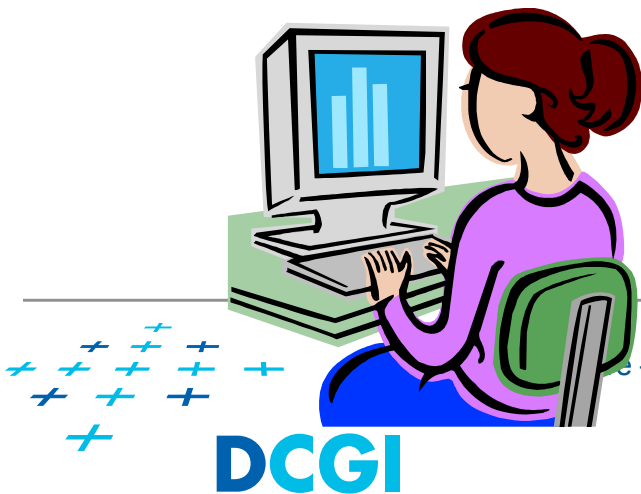
Mobile environment

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

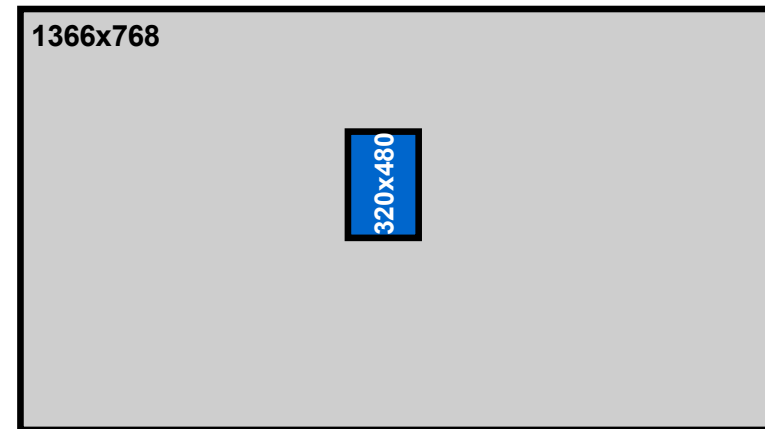
Mobile environment

- 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 most widespread smartphones have 7x smaller screen than most widespread 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



Worldwide January 2014

320x480 (16%)
320x568 (11%)
480x800 (8%)
720x1280 (7%)
240x320 (6%)

NA January 2014

320x568 (26%)
320x480 (25%)
720x1280 (9%)

Europe January 2014

320x480 (19%)
320x568 (15%)
480x800 (10%)
720x1280 (7%)

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



Huge variety on the mobile market

■ Type of devices

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

■ Platforms

January 2014

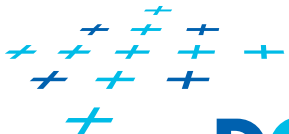
- Android (NA 39%, Europe 49% *)
- iOS (NA 53%, Europe 34% *)
- Windows Phone (NA 2%, Europe 4% *)
- BlackBerry OS (NA 4%, Europe 4% *)
- others

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

September 2013

- 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>*



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

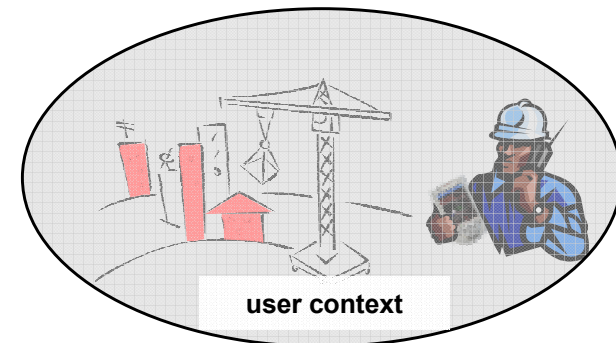
- 2a. Handling the user input
- 2b. Direct pointing (stylus/hand)

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

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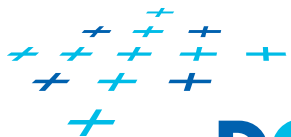
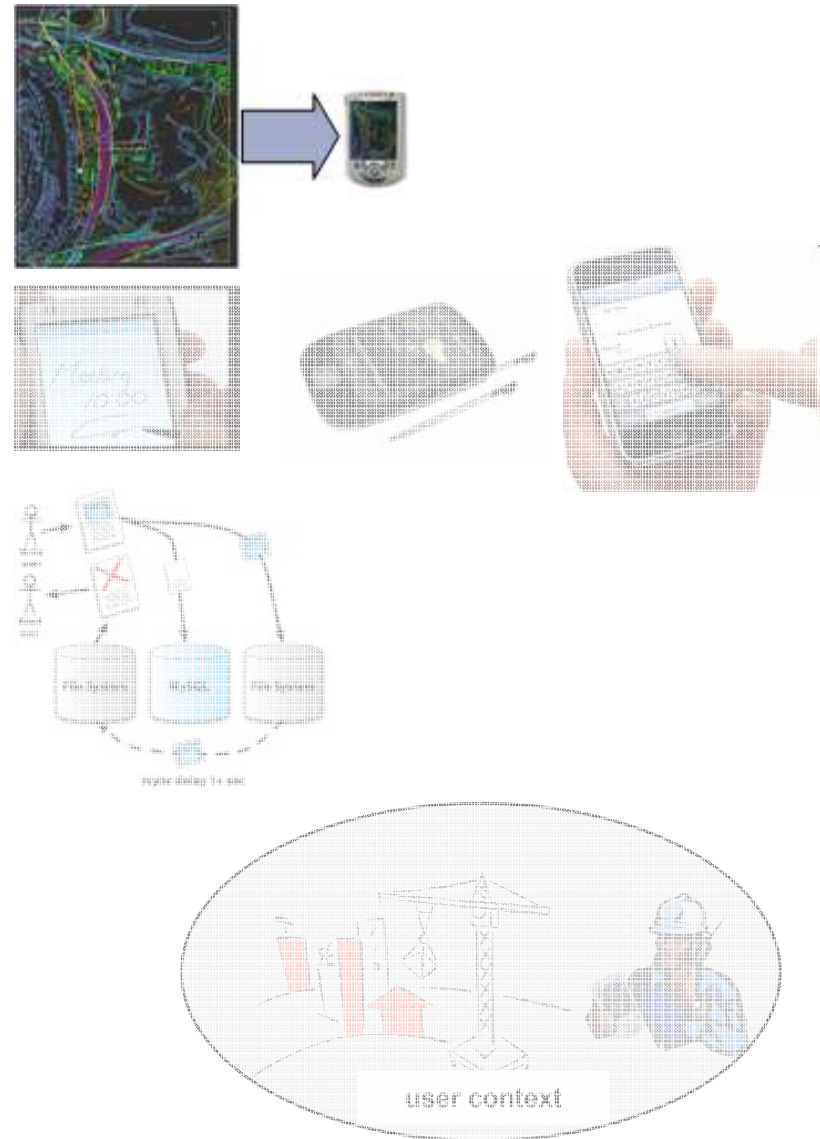
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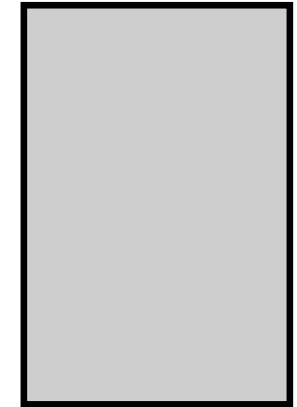
- 4a. frequent changes
- 4b. variety of parameters
- 4c. context driven UI



1a. Usage of the screen space – small screens

■ What is better orientation of the screen?

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

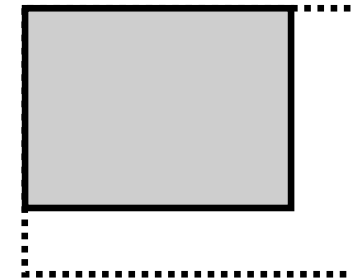


■ Why is bigger screen better than smaller?

- 320x480 (World 16%, NA 25%, Europe 19% *)
- 320x568 (World 11%, NA 26%, Europe 15% *)
- 480x800 (World 8%, Europe 10% *)

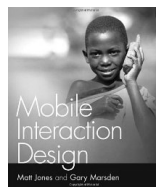
* <http://gs.statcounter.com> (January 2014)

- user efficiency vs. user satisfaction

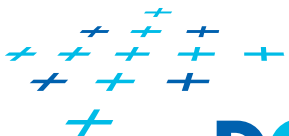


■ What about the complex content (News portal)?

- browsing vs. direct answer



Ch 9.2



DCGI



Thank you for attention

