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# PDA

## 1<sup>st</sup> lecture

### Introduction, mobile computing (definitions and limits)



# Contacts

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- Zdeněk Míkovec
  - xmikovec@fel.cvut.cz
  - K319



- Ondřej Poláček
  - polacond@fel.cvut.cz
  - K411



- Jan Vystrčil
  - vystrjan@fel.cvut.cz
  - K321



- consultation hours: at practices
- course web page: <http://pda.felk.cvut.cz>



# Classification

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## ■ Credits

- min. 40 points
- submitted semester project (D1-D4)
  - min. points per deliverable: 5

## ■ Exam

- not mandatory

## ■ Points

D1-D4	80 points
exam	20 points
<b>SUM</b>	<b>100 points</b>

## ■ Extra points

- SIGCHI lectures (18.10.) (5p)
- WUD 2010 11.11. 2010 (5p)
- max. number of points is 80p

## ■ Classification

- A ... 90 and more points
- B ... 80 - 89 points
- C ... 70 - 79 points
- D ... 60 - 69 points
- E ... 50 - 59 points

## ■ Consequences

- without exam not better than B



# Semester projects

- 1 project = 1 student
- mobile device available
  - RIM BlackBerry Curve 8520 (13x)
  - HTC Hero - Android OS (4x)
  - Nokia - Symbian OS (3x)
- development environment
  - BB JDE, Eclipse+plugin
  - simulators
  - real device (limited amount)
- **D1: project description (5p)**
- **D2: problem description (10p)**
- **D3: design I (25p)**
- **P1: Presentation – 5 best designs (5p)**
- **D4: design II + final report (35p)**
- submission at "eduweb"



# Lecture topics

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## ■ Design principles

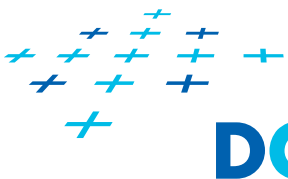
- Usage of the screen space
- User interaction
- Design generally
- Exploiting context

## ■ Development

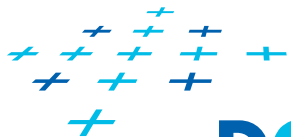
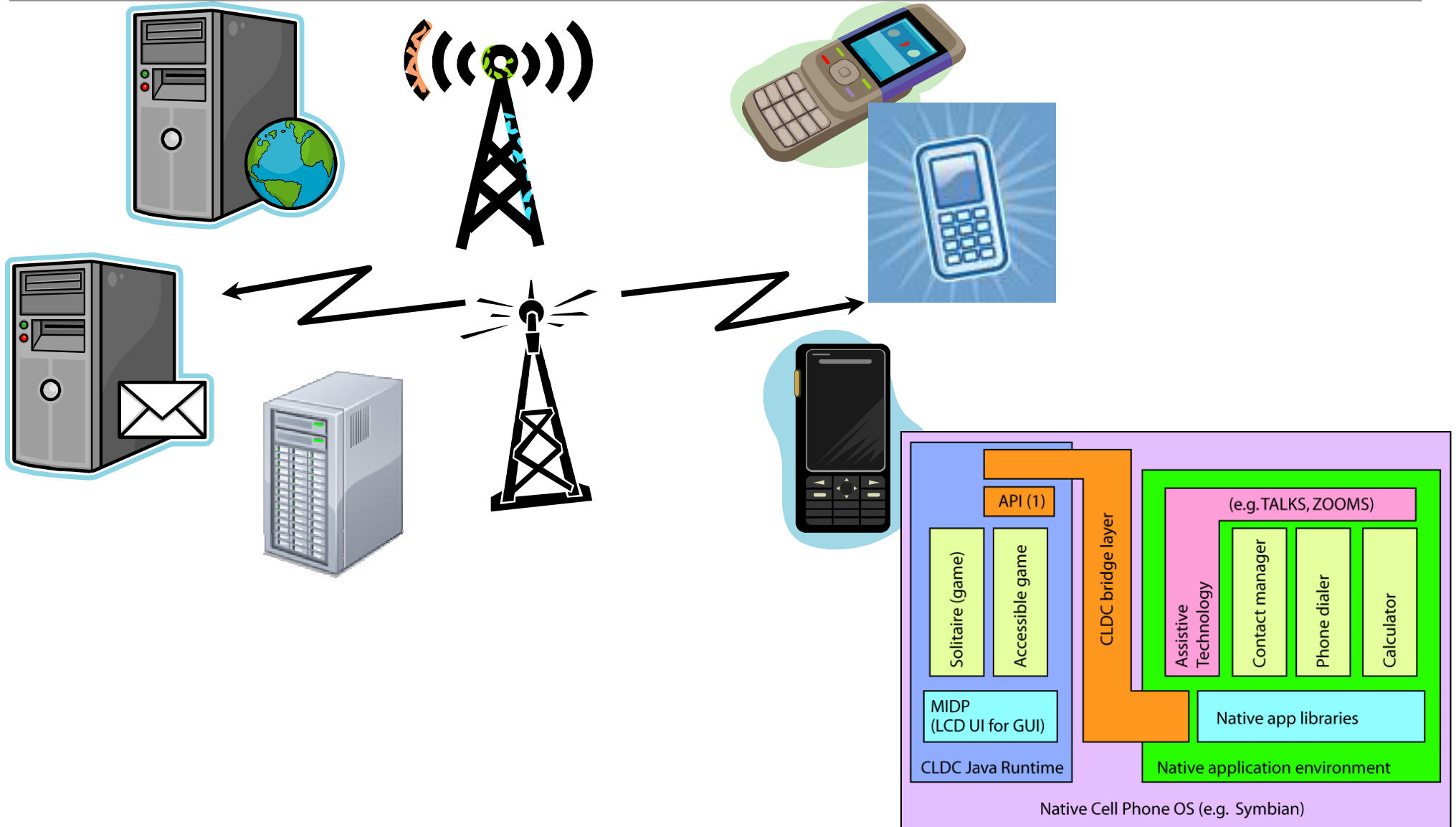
- Java ME
- Symbian OS
- Android

## ■ Mobile technologies

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



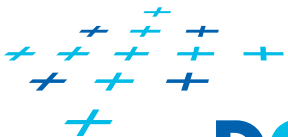
# Mobile computing – big picture



# Mobile computing

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- Aspects of mobility
  - user mobility
  - device portability



# Mobile environment

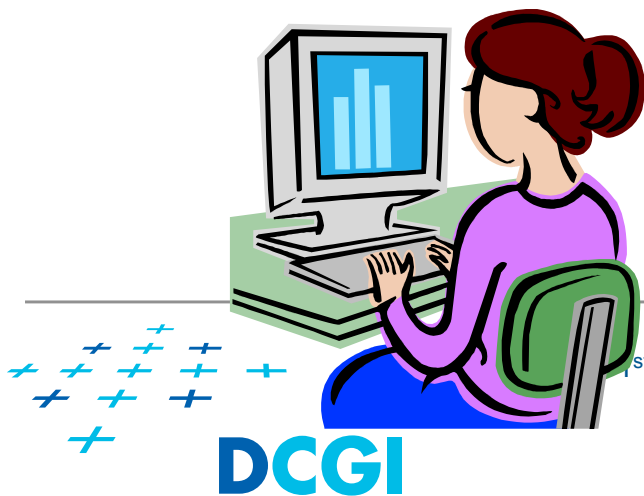
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## Typical environment

- stationary position
- large display
- variety of input devices
- low noise level
- stable lighting condition
- user with no special needs
- do 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

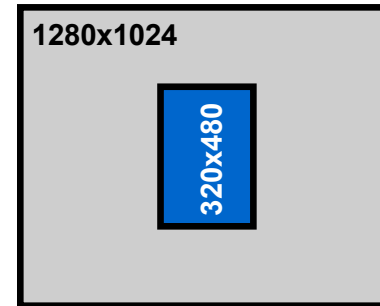




# Inherent characteristics of UI on mobile devices

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- **Small screen**
  - the biggest smartphones have 8x smaller resolution 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



# Huge variety on the mobile market

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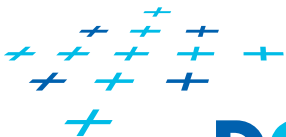
## ■ Type of devices

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



## ■ Platforms

- Symbian OS
- RIM BlackBerry OS
- Android
- iPhone
- Windows Mobile
- others



# Wireless communication

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

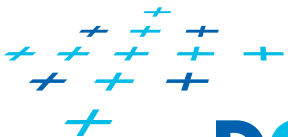


# What does it mean mobile for the UI design?

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## 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

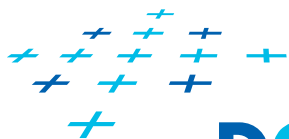
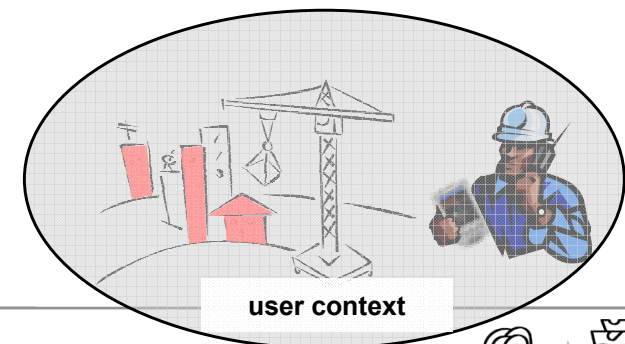
- 2a. Handling the user input
- 2b. Direct pointing (stylus/hand)

## 3. Design generally

- 3a. Guidelines
- 3b. Strange behavior

## 4. Exploiting context

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

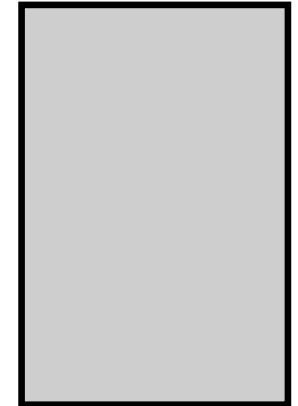


# 1a. Usage of the screen space – small screens

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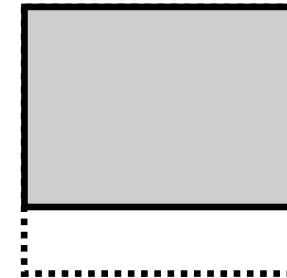
## ■ What is better orientation of the screen?

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



## ■ Why is bigger screen better than smaller?

- 320x320 (Palm) than 240x320 (Compaq)?
- user efficiency vs. user satisfaction



## ■ What about the complex content (News portal)?

- browsing vs. direct answer



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# Thank you for attention

