Mobile Application Development

MTAT.03.262

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Course Purpose

• Introduce mobile application development
• Introduce mobile platforms
  – Android OS
• Introduction to location based services
• Working with sensors
• Research in mobile cloud domain

Questions

• Have you ever programmed for mobile devices?

• How comfortable are you with programming?
  – Java?
    • External APIs?
  – Web programming?

• Have you heard of cloud computing?
Related Courses

• **MTAT.03.266** Mobile Application Development Project (3 ECTS)
  – Tue. 10.15 - 12.00, Ülikooli 17 - 219

• **MTAT.03.280** Mobile and Cloud Computing Seminar (3 ECTS)
  – Thu. 14.15 - 16.00, Ülikooli 17 - 220

• **MTAT.08.027** Basics of Cloud Computing (3 ECTS)
  – Spring 2018
Outline

- Mobile application development with Android
- Location based services
- Working with sensors
- Testing Android applications
- Mobile Cloud research
Grading

• No written exam
• Active participation in the lectures (Max 5%)
  – 80% attendance is compulsory
  – Submission of exercises performed in class (80% is compulsory) -- Let us call them course exercises
• Homework – 20%
  – 4 Home works
• Home Assignments – 75%
  – 3 Home Assignments
• You should score 50% in each subsection
Grading policy

• Up to 1 week delay
  – Your submission will be graded for 80%

• After 1 week delay until end of course
  – Your submission will be graded for 50%
Grading - continued

• Incentive for taking projects
  – “Mobile application development project” - MTAT.03.266
    • 3 more ECTS
    • 1 Man Month task / Person
    • 3-4 persons per group
    • To be delivered by middle of December 2017
Course schedule

- **Lectures:** Friday 14.15 - 16.00, J. Liivi 2-122
- **Practice sessions:** Friday 16.15 - 18.00, J. Liivi 2-122

- **Schedule of the lectures**
  [https://courses.cs.ut.ee/2017/MAD/fall/Main/Lectures](https://courses.cs.ut.ee/2017/MAD/fall/Main/Lectures)
Lecture 1

MOBILE APPLICATION DEVELOPMENT
# The Seven Mass Media

**First Mass Media Channel - Print** from the 1500s

**Second Mass Media Channel - Recordings** from 1900s

**Third Mass Media Channel - Cinema** from 1910s

**Fourth Mass Media Channel - Radio** from 1920s

**Fifth Mass Media Channel - TV** from 1950s

**Sixth Mass Media Channel - Internet** from 1990s

**Seventh Mass Media Channel - Mobile** from 2000s

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### Report: Mobile cloud to grow beyond $11 billion in 2018

**Written by CooperEgg // July 12, 2012 // No Comment // Cloud Performance**

The proliferation of smartphones, tablets and other mobile devices is contributing to change in the private sector, as businesses continue to leverage these gadgets in an attempt to enhance efficiency and potentially gain a competitive advantage. According to a new report by Global Industry Analysts, the evolution of mobility is also changing the cloud computing landscape, pushing the mobile cloud market to generate more than $11 billion in revenue by 2018.

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### Verizon's Stratton: The Future Of IT Is Mobile And Cloud

**9/ + Comment Now + Follow Comments**

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[Tomi T Ahonen]

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country or region</th>
<th>Number of mobile phones</th>
<th>Population</th>
<th>Phones per 100 citizens</th>
<th>Data evaluation date</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>China</td>
<td>1,206,553,000</td>
<td>134,856,836</td>
<td>69.2</td>
<td>September 2013</td>
</tr>
<tr>
<td>02</td>
<td>India</td>
<td>667,000,000</td>
<td>1,220,800,359</td>
<td>70.72</td>
<td>30 April 2013</td>
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<td>03</td>
<td>United States</td>
<td>327,577,529</td>
<td>310,866,000</td>
<td>105.9</td>
<td>June 2013</td>
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<td>04</td>
<td>Brazil</td>
<td>288,440,423</td>
<td>192,799,287</td>
<td>135.4</td>
<td>August 2013</td>
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<td>05</td>
<td>Russia</td>
<td>256,116,000</td>
<td>142,905,200</td>
<td>155.5</td>
<td>July 2013</td>
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<tr>
<td>06</td>
<td>Indonesia</td>
<td>236,800,000</td>
<td>237,561,363</td>
<td>98.69</td>
<td>September 2013</td>
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<tr>
<td>07</td>
<td>Pakistan</td>
<td>129,683,076</td>
<td>178,854,781</td>
<td>72.45</td>
<td>September 2013</td>
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<tr>
<td>08</td>
<td>Japan</td>
<td>121,246,700</td>
<td>127,328,085</td>
<td>55.1</td>
<td>June 2013</td>
</tr>
<tr>
<td>09</td>
<td>Nigeria</td>
<td>114,000,000</td>
<td>165,200,000</td>
<td>69</td>
<td>May 2013</td>
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<tr>
<td>10</td>
<td>Bangladesh</td>
<td>110,675,000</td>
<td>165,039,000</td>
<td>73.3</td>
<td>September 2013</td>
</tr>
</tbody>
</table>
Popular consumer mobile applications

• Location-based services (LBSs)
  – Deliver services to users based on his location

• Mobile social networking
  – Most popular social networking platforms have apps for mobiles

• Mobile commerce
  – An extension of e-commerce

• Mobile payment
  – Near field communication (NFC) payment
Popular consumer mobile applications - continued

• Context-aware services
  – Context means person's interests, history, environment, connections, preferences etc.
  – Proactively serve up the most appropriate content, product or service

• Mobile instant messaging (MIM)
  – Skype for mobiles

• Mobile e-mail

• Mobile video
Variety of languages and platforms to choose from

<table>
<thead>
<tr>
<th>Programming language</th>
<th>Debuggers available</th>
<th>Emulator available</th>
<th>Integrated development environment available</th>
<th>Cross-platform deployment</th>
<th>Installer packaging options</th>
<th>Development tool cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe AIR</td>
<td>Yes</td>
<td>Yes</td>
<td>Flash Builder, Flash Professional</td>
<td>iOS (iPhone, iPad, iPod touch), Android, BlackBerry</td>
<td>The native distribution format of each platform</td>
<td>Flash Builder, Flash Professional - Commercial licenses available Adobe AIR SDK (command line tool)$$ - Free</td>
</tr>
<tr>
<td>Airplay SDK (Now Marmalade)†</td>
<td>Yes</td>
<td>Yes</td>
<td>Visual Studio, XCode</td>
<td>All native: Android, BlackBerry, BREW, iOS (iPhone), Maemo, Palm/webOS, Samsung bada, Symbian, Windows Mobile 6.x and desktop, OSX</td>
<td>The native distribution format of each platform</td>
<td>Commercial licenses available</td>
</tr>
<tr>
<td>alcheMo</td>
<td>Java</td>
<td>Debugger integrated in Visual Studio, Eclipse or XCode</td>
<td>Emulator is available in corresponding IDE</td>
<td>Android, BREW, iOS (iPhone), Windows Mobile</td>
<td>The native distribution format of each platform</td>
<td>Commercial licenses available</td>
</tr>
<tr>
<td>Android</td>
<td>Java but portions of code can be in C, C++</td>
<td>Debugger integrated in Eclipse, standalone debugging monitor available</td>
<td>Eclipse, Project Kenai Android plugin for NetBeans</td>
<td>Android only, because of Dalvik VM, March 2009</td>
<td>apk</td>
<td>Free</td>
</tr>
<tr>
<td>Appcelerator</td>
<td>JavaScript</td>
<td>Debugging available using Testit Studio, Rapiti</td>
<td>Satoshi Srinama, internal SDK</td>
<td>Adobe, iPhone, BlackBerry, Canvas, Flash Player, HTML5</td>
<td>The native distribution format of each platform</td>
<td>Apache 2.0 License, commercial licenses</td>
</tr>
</tbody>
</table>

http://en.wikipedia.org/wiki/Mobile_application_development
http://en.wikipedia.org/wiki/Mobile_operating_system
Popular platforms – Market share

http://en.wikipedia.org/wiki/Mobile_operating_system
The devices we use
MOBILE APPLICATION DEVELOPMENT WITH ANDROID