Distributed Systems – Assignment 1

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The Exercise

- Objectives
  - Get familiar with Android programming
    - Emulator, debugging, deployment
  - Learn to use UI elements and to design an Activity
  - Learn how to connect Activities and Services using Intents
  - Learn how to use the Sensor API
  - Tackling problems with developing a real app

- Dates:
  - Exercise begins: Now (October 4, 2010)
  - Exercise is due: 9:00am, October 15, 2010

The Tasks

- Assignment is divided up into **3 tasks**
  - **First Task:** Sensors and Actuators
    - Produce an application to access all available Sensors
    - Use selected actuators
  - **Second Task:** AntiTheft Alarm
    - Produce an application to *"secure"* the device against theft
  - **Third Task:** Enhancements of Task 2
    - Come up with creative solutions to deal with the shortcomings of the simple alarm

Task 1: Sensors and Actuators

- **Objectives:**
  - Learn how to create Android project
  - Familiarise yourself with UI Elements
  - Understand the concept of Activities and Intents
  - Learn to use the sensor API
- **Todo:**
  - Write an app that displays all sensors in a ListView
    - Show sensor readings in second activity
  - Trigger actuator events in a third activity
    - accessible from the first

Task 2: AntiTheft Alarm

- **Objectives:**
  - Transfer the knowledge of Task 1 into a real app
    - Understand problems stemming from a framework under development
  - Think about how to make use of the sensors
  - Learn how to use background services
- **Todo:**
  - Write an app to *"secure"* the device against theft
    - Sound an alarm when the device is moved (without authorisation)

Task 3: Enhancements

- Problems with Task 2 include:
  - Headphones can suppress alarm
  - HTC Desire with 2.2 (currently) unable to process sensor events when in Standby
    - Unable to lock and thus protect the alarm
- Possible solutions:
  - GPS
  - Silent alarm
  - BroadcastReceiver
- **Todo:** Come up with a creative solution to one of the problems

The Report

- You are required to produce a **report**
  - *Max 1 page!*
  - About your experience with **tasks 2 and 3**
  - <u>Motivate</u> and <u>explain</u> your enhancement (Task 3)

  - **Other Ideas:** Problems, design choices, code snipplets, UML class diagrams, documentation, comparison to Symbian/iOS (if previous experience in those), …

Marks

- First Task and Report: 4.0
- First Task, Second Task and Report: 5.0
- All three Tasks and Report: 6.0

Partially solved exercises are marked individually.

Report is necessary for a PASS mark!

Tips

- Make sure a new **activity** is always **referenced in the Manifest.xml** file
- Make sure **debugging is enabled** in the manifest file if you want to debug on the device
- Don't bother with the SensorEmulator
- Pay attention to the **app lifecycle** (i.e. onCreate(), onResume(), …)
- Make sure you give your app **permission** to access actuators like camera and vibration
- *Last but not least:* **Use a fresh install of Galileo**

Submission
https://www.vs.inf.ethz.ch/edu/vs/submissions/

- You should submit the code and report at the above URL
- **NETHZ Login**
- Note:
  - Max file sizes
  - File types
  - Multiple submissions possible
  - **Due Date!**