Application Development for Mobile and Ubiquitous Computing
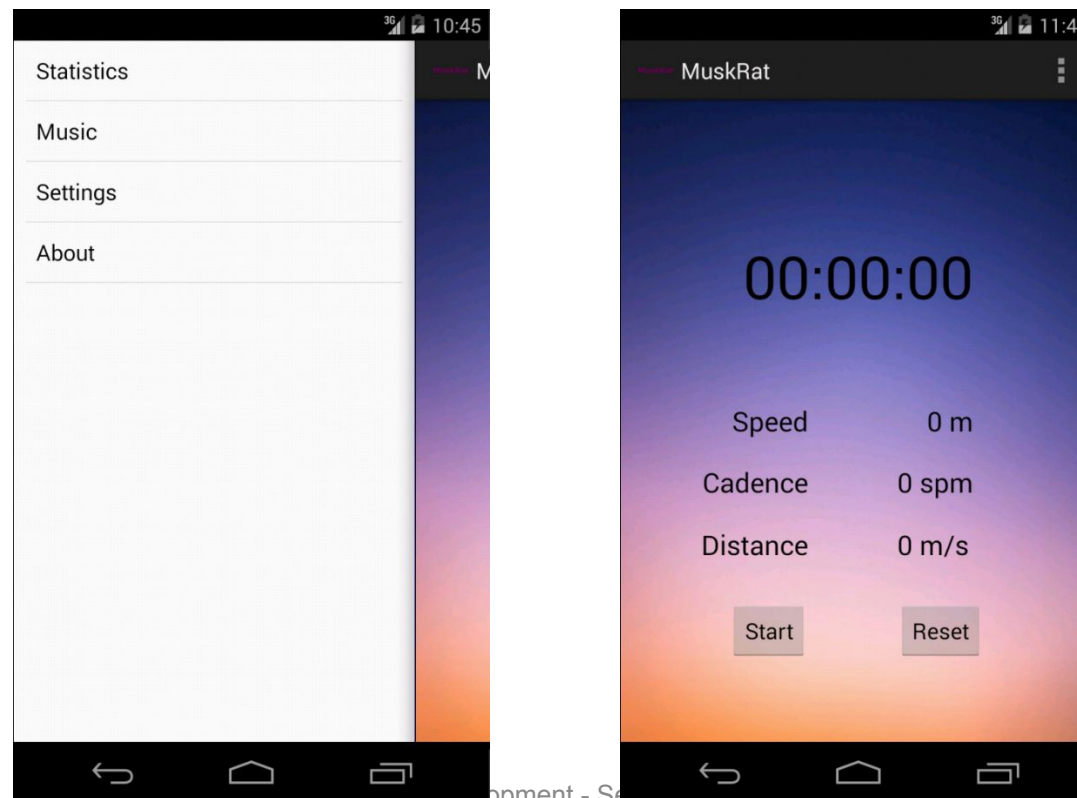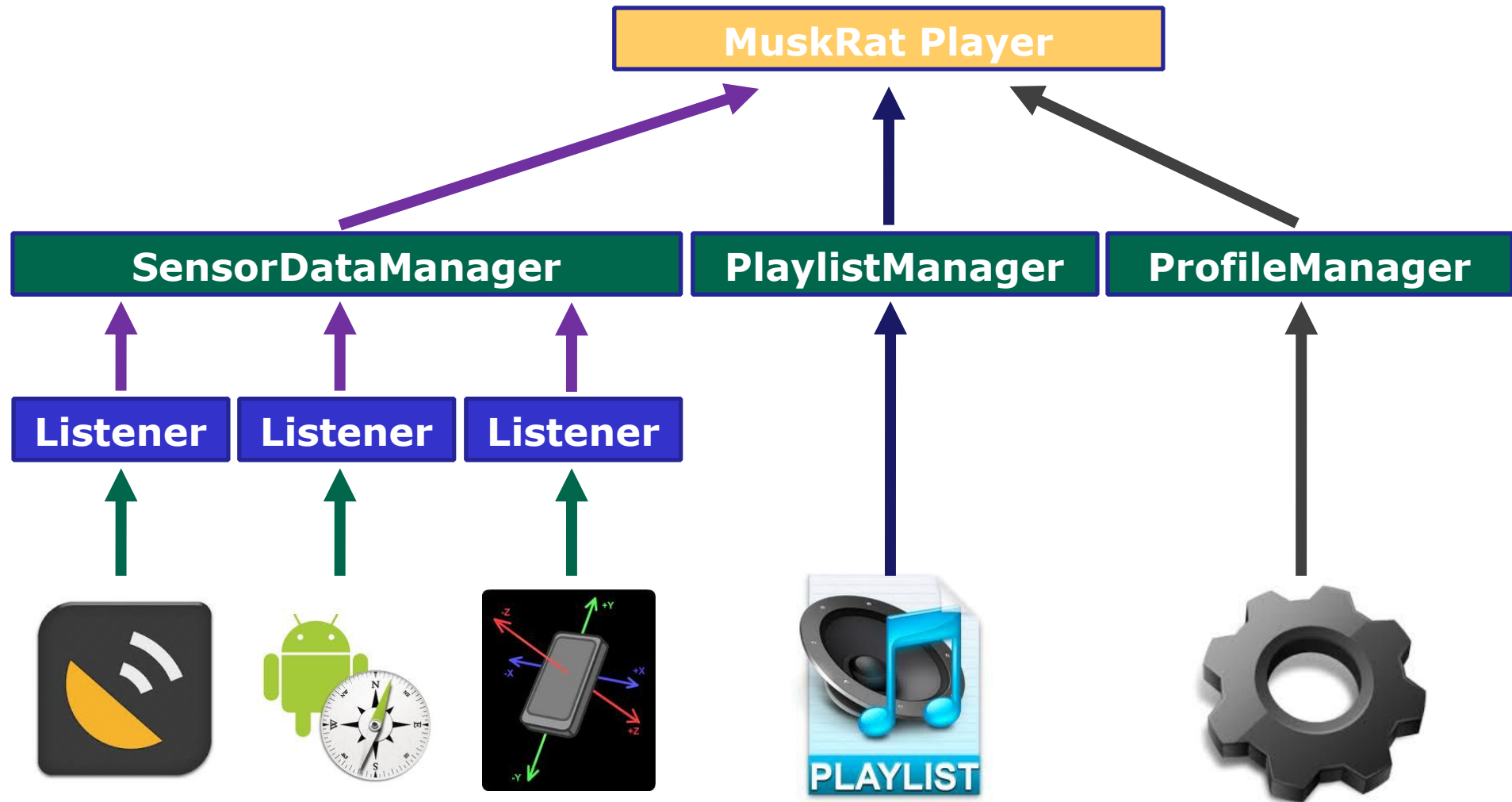
Seminar Task

Second Presentation

GroupNo. 16
Team: Jun Sun & Zhen Xiao

- Users view running statistics, such as speed, time and distance;
- Application plays appropriate music according to running statistics (speed, cadence …) in real-time

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MuskRat Player

SensorDataManager   **PlaylistManager**   **ProfileManager**

Listener   **Listener**   **Listener**

- **Sensor Data Manager**
  - Dynamic threshold adjustment
  - Combination of sensor data

- **Playlist Manager**
  - Pre-annotation of musics

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- **Profile Manager**
  - Multi-user profiles
  - Store user profiles locally

- **Heterogeneity**

- Supporting different screens
- Supporting different sensors
    - o The sensitivity and accuracy of different devices vary a lot
    - o Have to run "warm-up" program to adjust

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- **Energy challenge**
- Music playing consumes energy
- Fetching sensor data continuously consumes energy
- Energy is limited

- **Adaptation mechanism:**
  - Predict user motion if some sensor data currently not available;
  - Based on available sensor data and historical data

- **Context:**
  - **1. Speed**
    - get from GPS receiver directly;
    - phase variation in the radio signal;
    - rather than distance over time;
    - more accurate than you'd expect from the position accuracy
  - **2. Cadence**
    - use a combination of data from gravity sensor, acceleration sensor and GPS receiver;
    - delta greater than threshold is considered as a 'footstep';
    - **currently no decent open source libraries**

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Tasks remaining:

- Jun Sun
  - User Interface
  - Playlist Manager
  - „Mashup"
  - Testing

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- Zhen Xiao
  - Profile Manager
  - Sensor Data Manager

Thank you!