AWARE: Open Source Mobile Sensing Framework

**Background:** The smartphone is used as a sensing platform among a great number of researches. However, the development cost for a stable sensing application is quite high and takes lots of tedious works.

**Goal:**
- Providing a stable mobile crowd sensing framework
- Continues integration by open source community, and flexible framework integration

![Screenshot of a sample mobile app](image1.png)

![System architecture](image2.png)

![Data collection performance of each condition](image3.png)

Route Construction Method Based on Traffic Load for Cellular-assisted MANET

**Purpose:**
MANET, which uses mobile communication, may cause uneven traffic load distribution since its area restriction algorithm prioritizes a neighboring area of a node having many neighboring nodes to make a virtual area.

**Result:**
Succeeded in distributing the traffic load of each node and reducing the load in the network.

![Simulation result](image4.png)

MiMoSense: An Open Crowdsensing Platform for Micro-Mobility

**Background:**
The lack of an open sensing platform for micro-mobility forces researchers to build their own data collection platform from scratch, which could be laborious.

**Contribution:**
1. As an open-source platform, MiMoSense shifts the researcher’s focus from software development to sensing data analysis.
2. MiMoSense’s various interface could unleash the potential of micro-sensing related research.

![Prototype on E-Scooter](image5.png)

![Research Workflow in MiMoSense](image6.png)

![Battery Consumption and Message Latency Evaluation](image7.png)

Personal Mobility Optimization Using Available Taxi Resources

**Background:**
Rapid spread of dockless micromobility such as electric scooters and increase in relocation costs

**Excess supply of existing means of transportation (e.g., cabs) due to the increase in new transportation

**Use excess resources to optimize the relocation of dockless micromobility:**
- Context detection in taxi cabs
- Simulation of collection and relocation scheduling of electric scooters

![Scooter distribution map](image8.png)

![Feature diagram of clusters](image9.png)

![Context Estimation Using Taxi](image10.png)

Estimate UV Exposure by using Signal Strength from Satellites

**Background:**
Too much UV exposure cause skin cancer
Vitamin D is produced when we are exposed to UV

**Purpose:**
Estimate UV exposure from smartphone(without especial sensor)

**Proposed Method:**
Measured UV exposure and strength of GPS in a sunny day
Estimated UV exposure from the strength of GPS

![GPS intensity and UV amount](image11.png)

![UV sensor](image12.png)

Application of measuring GPS

![Screenshots of Selfguard](image13.png)

Designing an Incentive Model for Promoting Hygiene Behaviors

**Background:**
A behavioral tracking application (Selfguard) recognizes users’ infection prevention behaviors such as hand washing, stay recording, and physical condition recording through sensor-based experiments and data analysis. By providing incentives for those behaviors, we will identify how they affect people’s behavior.

**Significance:**
Our goal is to help users improve their person hygiene and lower the risk of infection.

![Selfguard’s Overview](image14.png)