ACM SIGCHI Summer School on User Modeling and Personalization in Urban Computing (Umcit 2019)

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1 Day 1

1.1 Opening presentation and key note

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- Exploring the importance of sensors in smart devices for urban sensing.
- How to gather data through crowdsensing mobile sensors and applications.
- Urban computing for solving traffic estimation challenge.

1.2 Mobile Crowdsensing

- Brief history of smartphones and development.
- Gathering data using mobile sensors
  - sensor gathers data of user mobility.
  - gathering information from user like spots/browser history/non-likes etc.
  - purpose is to design recommendation system for large scale use.

1.2.1 Mobile Sensing

- Smartphone sensing
- Sensing via Software APIs
- Mobile Apps

1.2.2 Personal Sensing

- Collecting data for user purpose **ONLY**

1.2.3 Public Sensing

- Collecting data for public purpose. Data can be stored on unprotected cloud servers.

1.3 Discussion on evolution of mobile phones

- discussion on evolution of sensor devices, ranging from first generation smartphones to recently available smartphones ex. bluetooth, infrared, camera, gyroscope, accelerometer, barometer, light sensor, ambient sensor, GPS.

1.4 Components that enable mobile computing

- Apps (personal sensing apps), surveillance, car and bike sensors etc.

1.5 Major talk on sensors

- Motion sensors
  - Accelerometer (for measuring the acceleration of user. very sensitive)
  - Gyroscope (navigational precision. stable)
  - Magnetometer (direction strength)
  - Proximity (distance with respect to destination)
  - Pedometer (steps movements of the legs)
- Environmental sensors
  - Ambient light
  - Barometer
- Radio
  - GPS
  - Cellular radios (not easily available data e.g cell phone antennas)
  - Wifi
  - Bluetooth
- External sensors
  - Car sensors
  - Bike sensors
  - Wearables
- Motion sensors
  - Ambient light
  - Barometer