Indoor Localisation

Indoor Localisation

- Localisation using Dead Reckoning

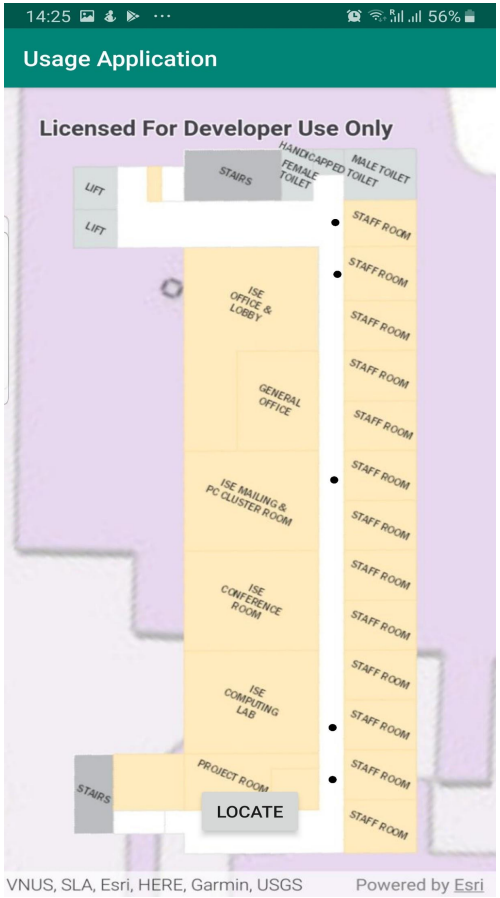
- Fingerprinting

Localisation using Dead Reckoning

- Weiberg SL Algorithm
- ZUPT algorithm
- Modified ZUPT

Fingerprinting

- Euclidean distance using Wifi only
- Euclidean distance using Wifi and magnetometer
- But iPhone does not allow to sense Wifi….



Fingerprinting using Wifi only

Fingerprinting using Neural Network

- A new approach to fingerprinting - 3 hidden layer deep neural network
- Modelled fingerprints using magnetometer readings and bluetooth beacons
- Assisted by dead reckoning for live positioning

Moving Window - Sequential matching

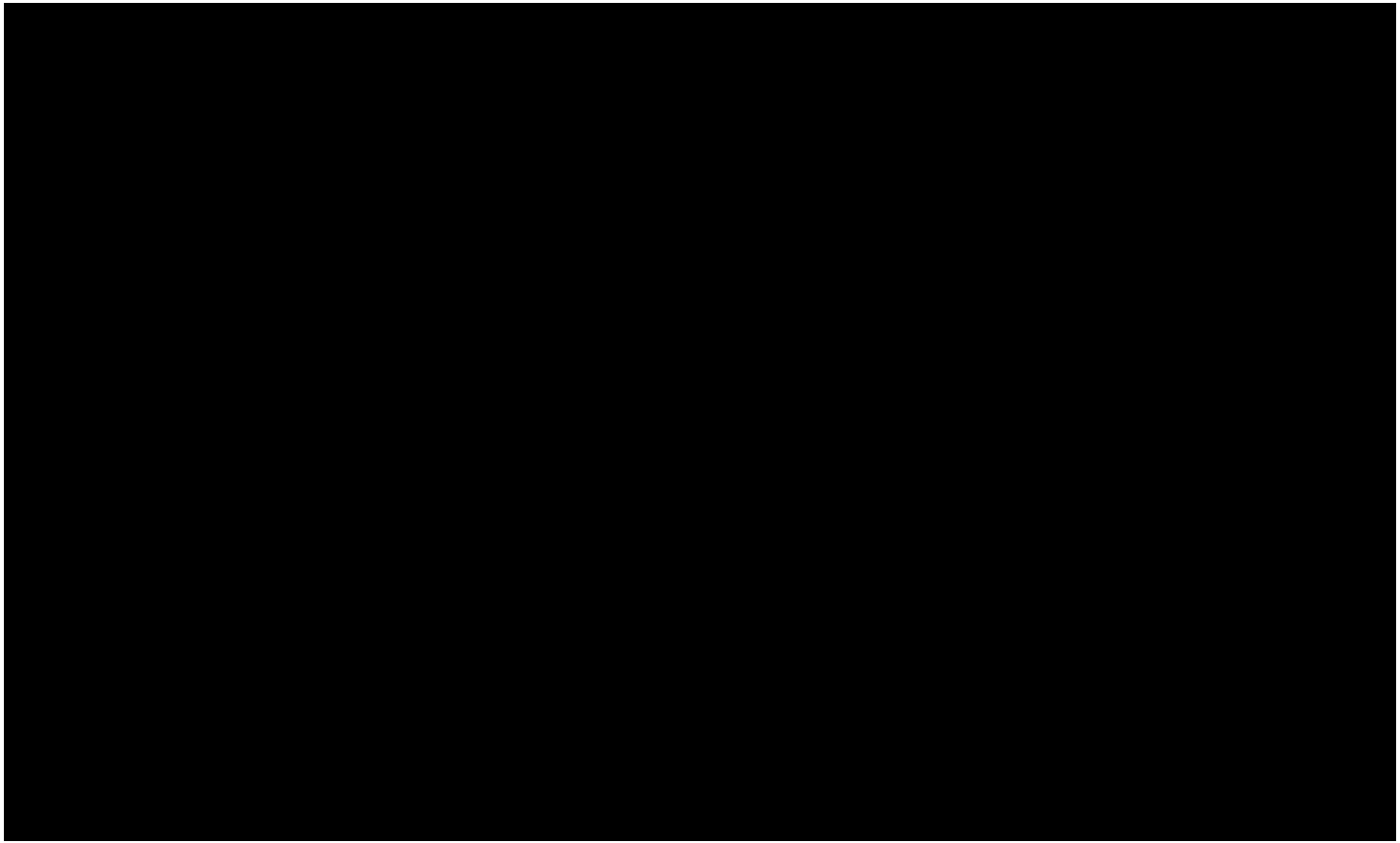
- Depending only on magnetometer readings.
- Keeping track of previous n(=2) steps.
- Trying to fit best sequence in the data.
- When we get new point, we find nearest neighbours to the current point using KNN and match its neighbours to our history.

Working on screenshot:

- In the screenshot folder,
- Fingerprinting Application - Server attached to it :
  - Server File name: fpServer.py.
    - Run this file before switching on the application.
  - Application name : maps_steps.
    - Need to mark the point on the screenshot, and walk for few seconds and repeat.
- Usage Application - Server attached to it.
  - Server File name: usageServer.py.
    - Run this file before switching on the application.
  - Application name: UsageApplication
    - Need to press start locating.

Working on Maps:

- In the Maps folder,
- Fingerprinting Application - Server attached to it :
  - Server File name: fpServer.py.
    - Run this file before switching on the application.
  - Application name : nus_maps.
    - Need to mark the point on the screenshot, and walk for few seconds and repeat.
- Usage Application - Server attached to it.
  - Server File name: usageServer.py.
    - Run this file before switching on the application.
  - Application name: UsageApp
    - Need to press start locating.



Fingerprints of level 2 - i4.0