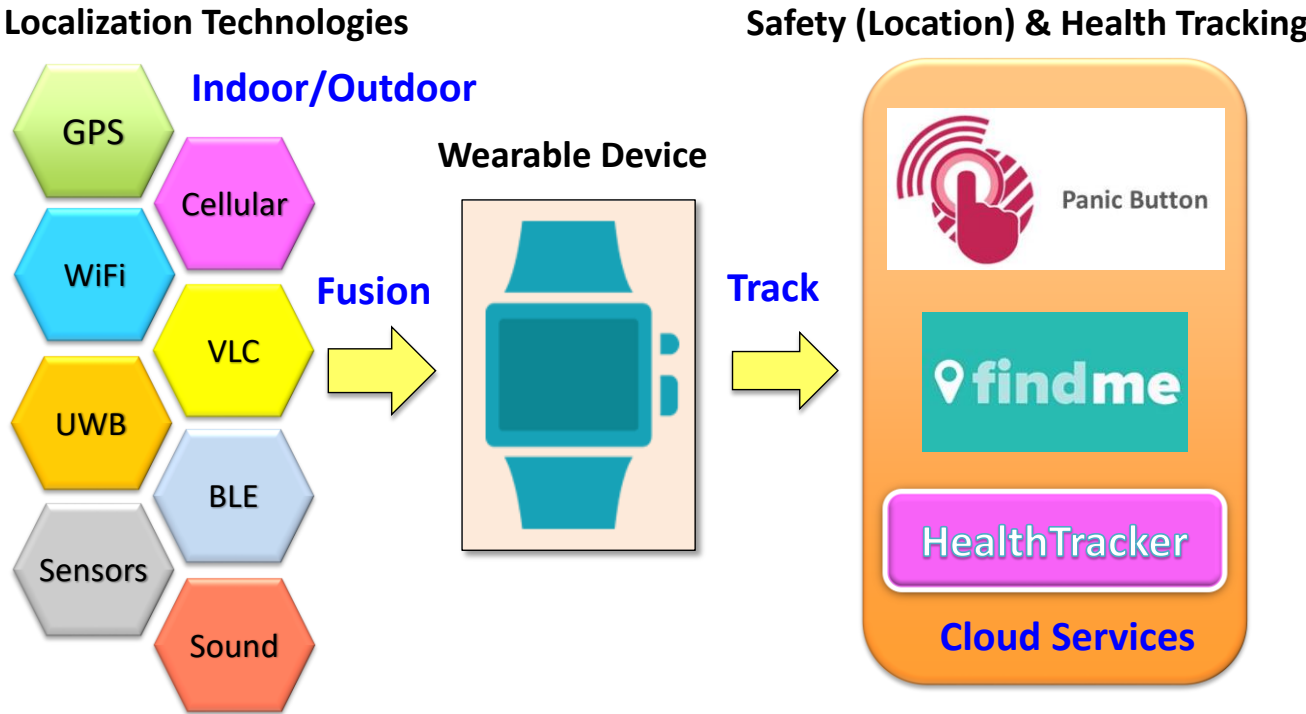


Project Title: IoT System for Public Health and Safety Monitoring with Ubiquitous Location Tracking

Develop a system which enables tracking of location, lifestyle and health status in promotion of public health and safety in ASEAN countries taking into consideration ASEAN culture, lifestyles, behaviours and infrastructures



Dr. David Chieng (MIMOS, Malaysia)

Project Title: IoT System for Public Health and Safety Monitoring with Ubiquitous Location Tracking

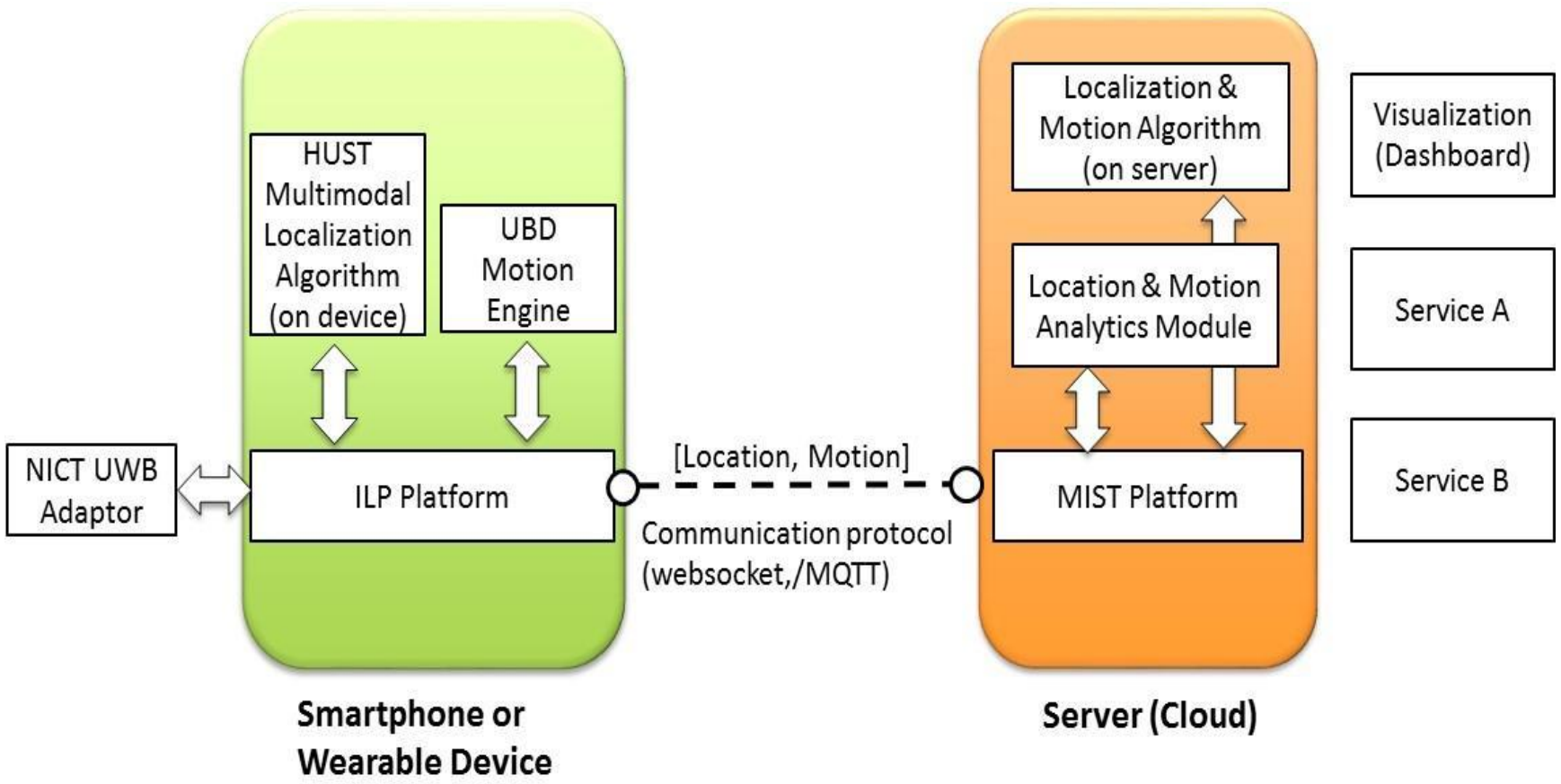
Project Members :

- Dr. David Chieng (MIMOS, Malaysia)
- Dr. Huan-Bang Li (NICT, Japan)
- Dr. Arosha Senanayake (UBD, Brunei)
- Dr. Dao Trung Kien (MICA, Vietnam)
- Prof. Minoru Sasaki (Gifu University, Japan)*
- Dr. Yeo Kwok Shien (TARUC, Malaysia)*



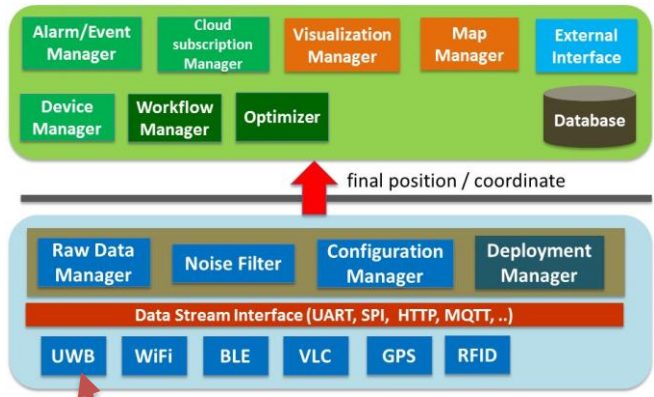
Project Duration :

April 2017 – March 2020 (3 years)

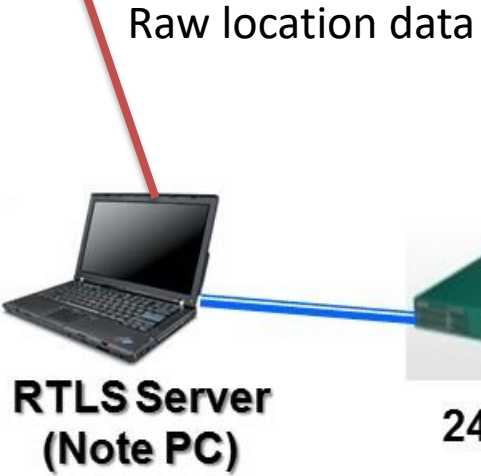


MIMOS & NICT UWB R&D Testbed

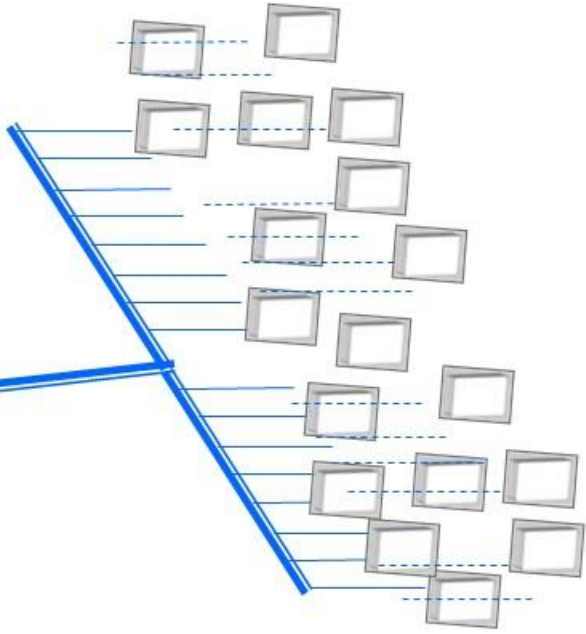
Project Activities: MIMOS & NICT UWB R&D Testbed



MIMOS Location Platform

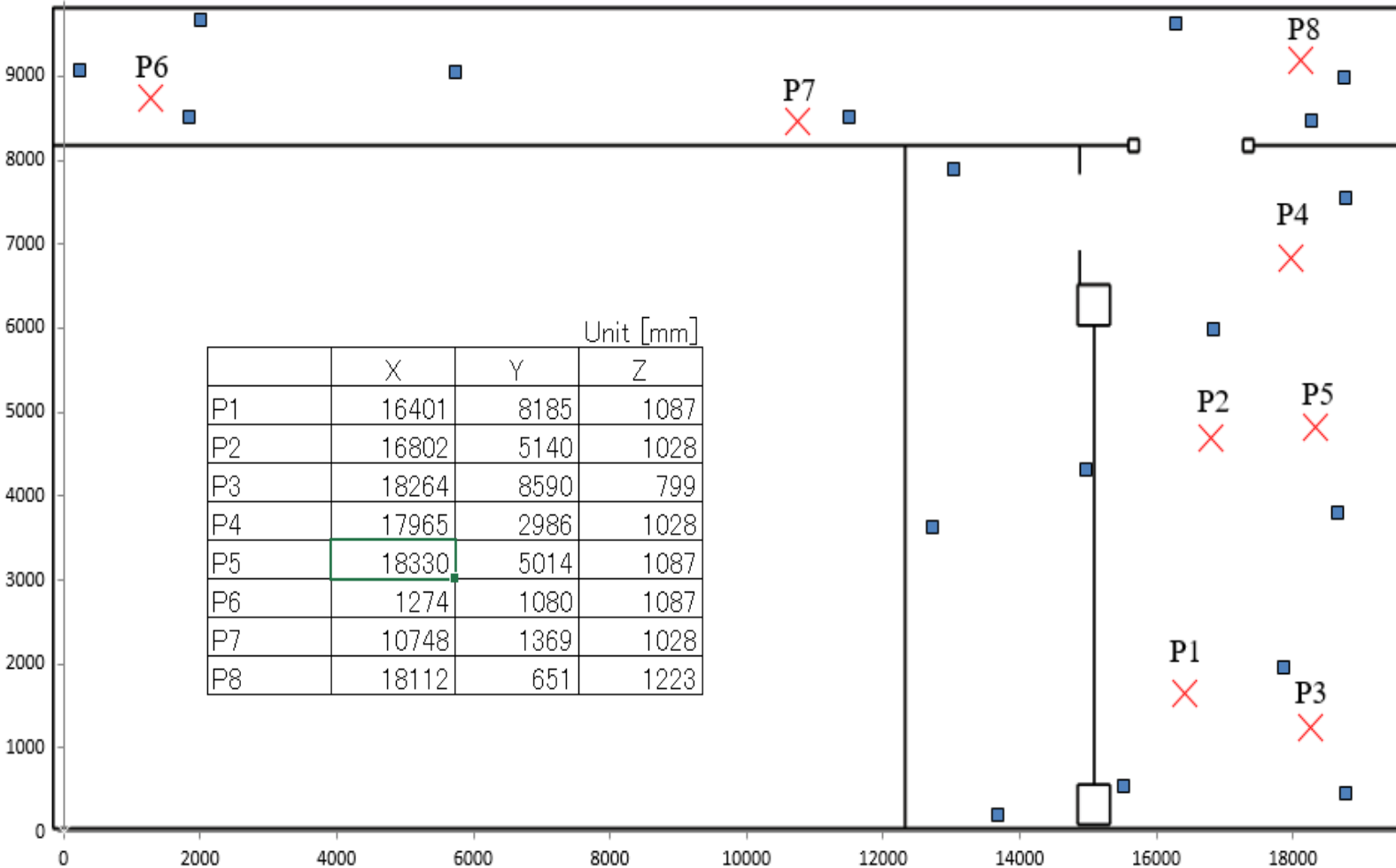


24portHUB



Anchor nodes

Mobile nodes



Project Activities: Installation & Testing

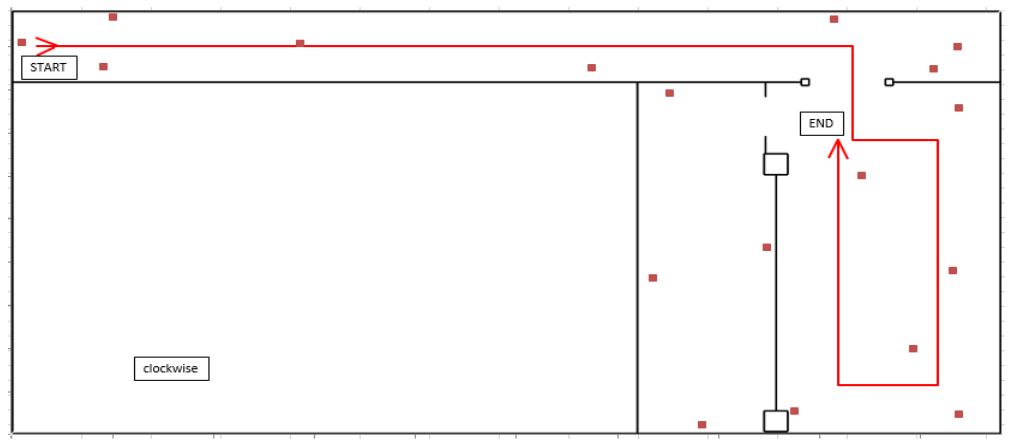




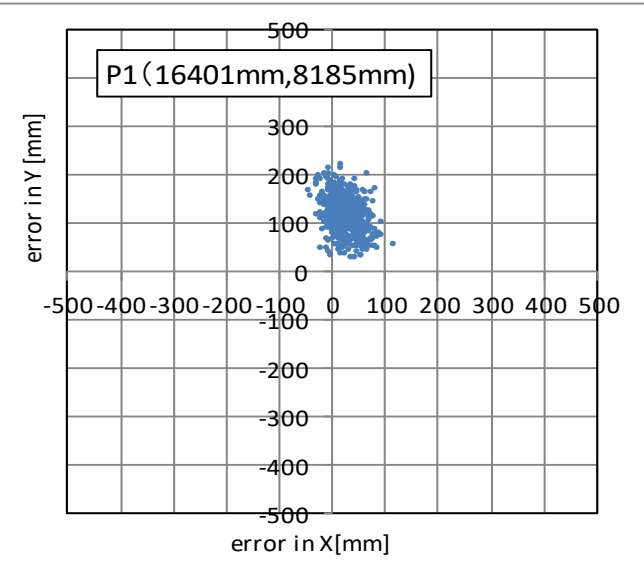
Ranging/Accuracy Test



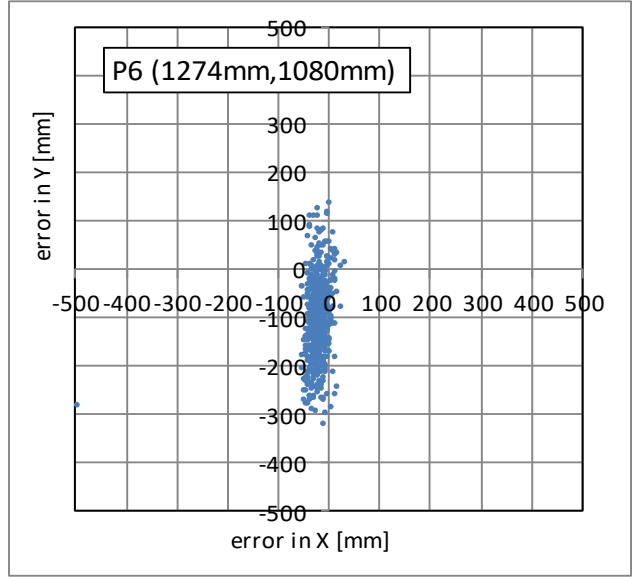
Walking Test



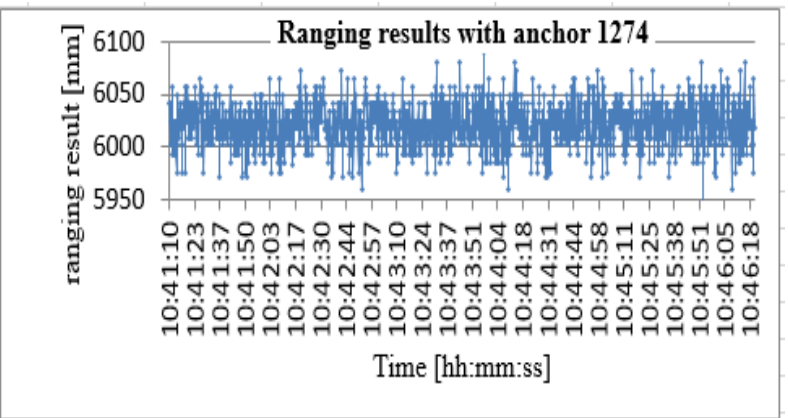
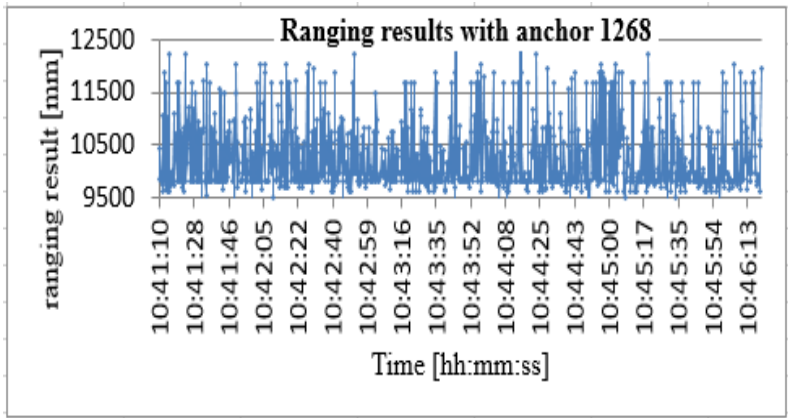
R&D Results: Accuracy (Fixed Location)



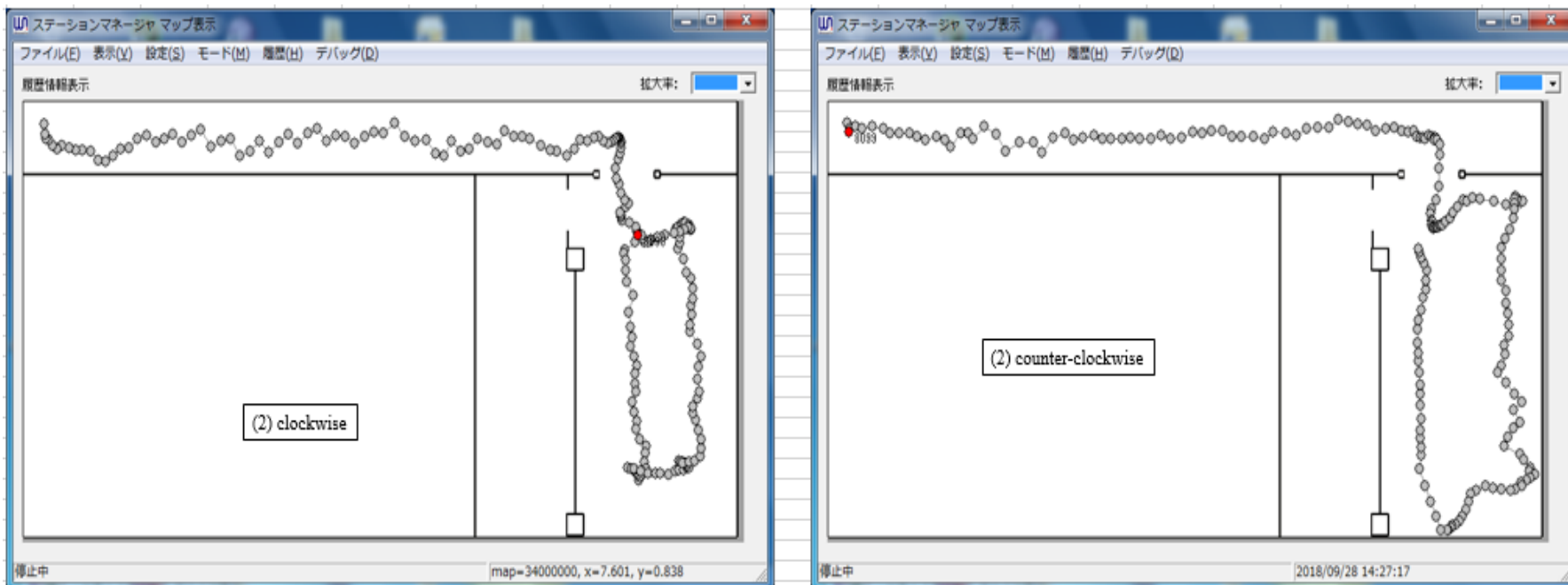
Position 1: within 20cm



Position 2: within 40cm

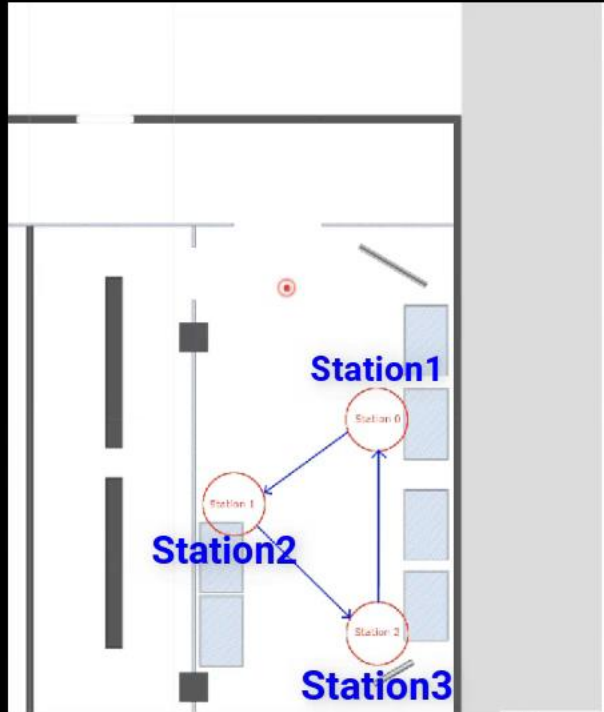


Position 1: Ranging Result with different anchors



- Body effect has a significant effect
- The positioning accuracy is within 20cm if there is no reflection.
- Certain area experienced high reflection due to TV screens
- Filtering in the upper layer is expected to filter out odd data (reflection).

Real-Time Personnel Tracking Demo



Dashboard



Live Video

MIMOS & MICA WiFi Positioning Trial

Project Activities: MIMOS & MICA WiFi Positioning Trial

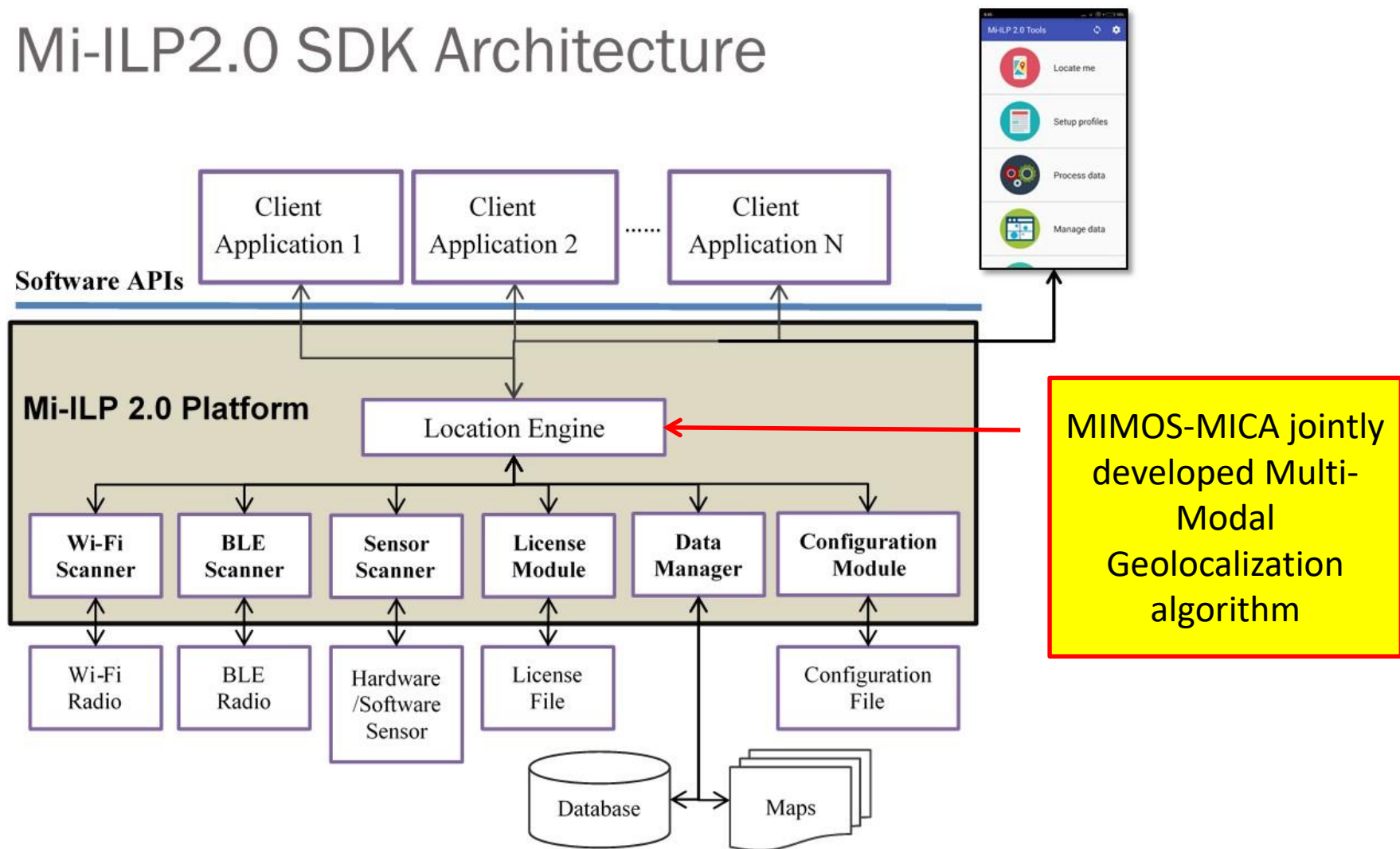


- **VINCOM MEGA MALL TIMES CITY**
- **Largest mall in Hanoi.**
- **200,000 square meter**

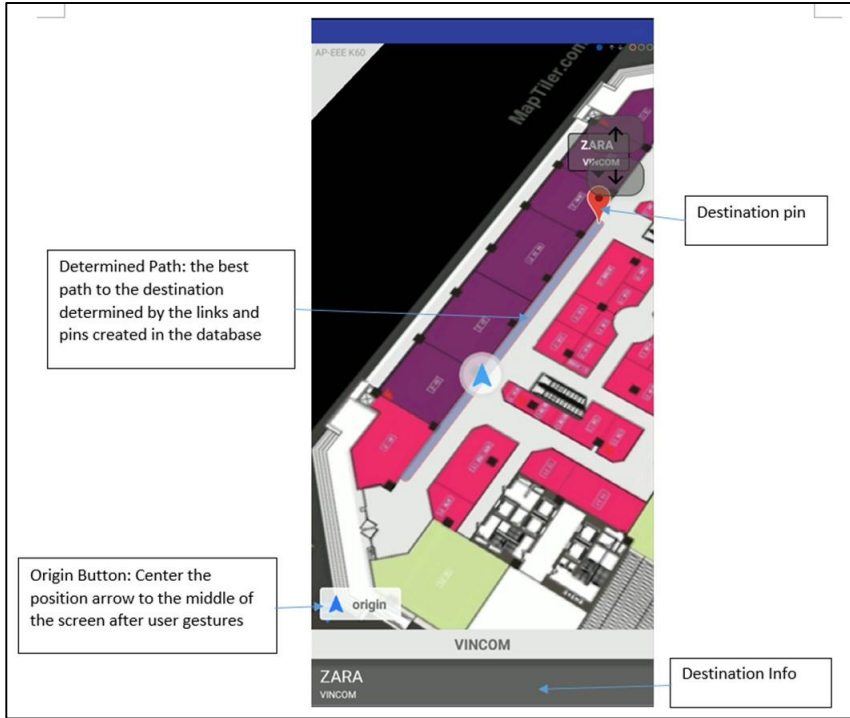


- **Mapping and Calibration**

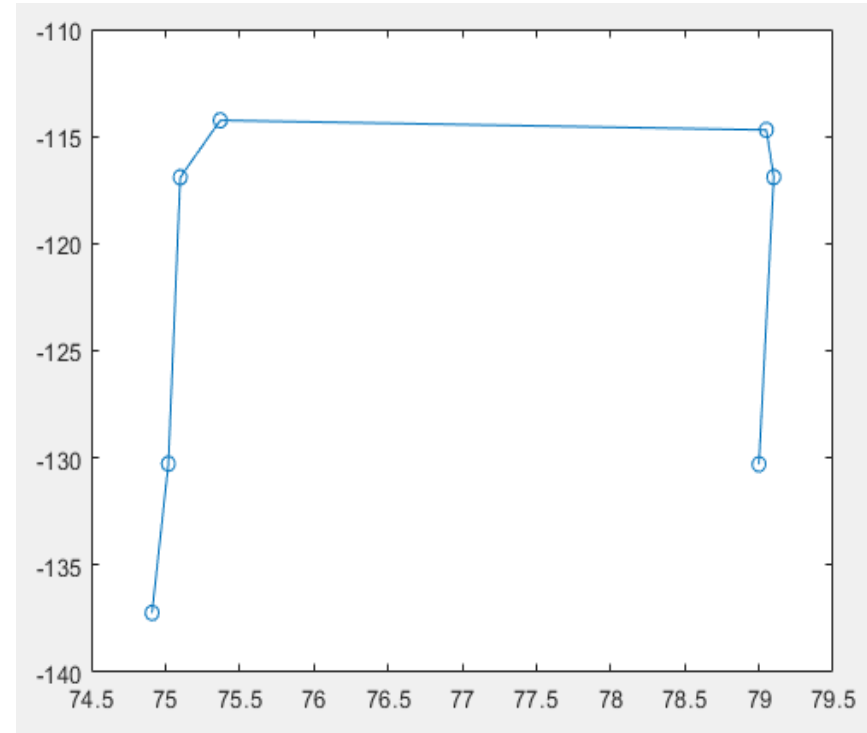
Mi-ILP2.0 SDK Architecture



MIMOS-MICA jointly developed Multi-Modal Geolocalization algorithm



Screenshot of Mobile App

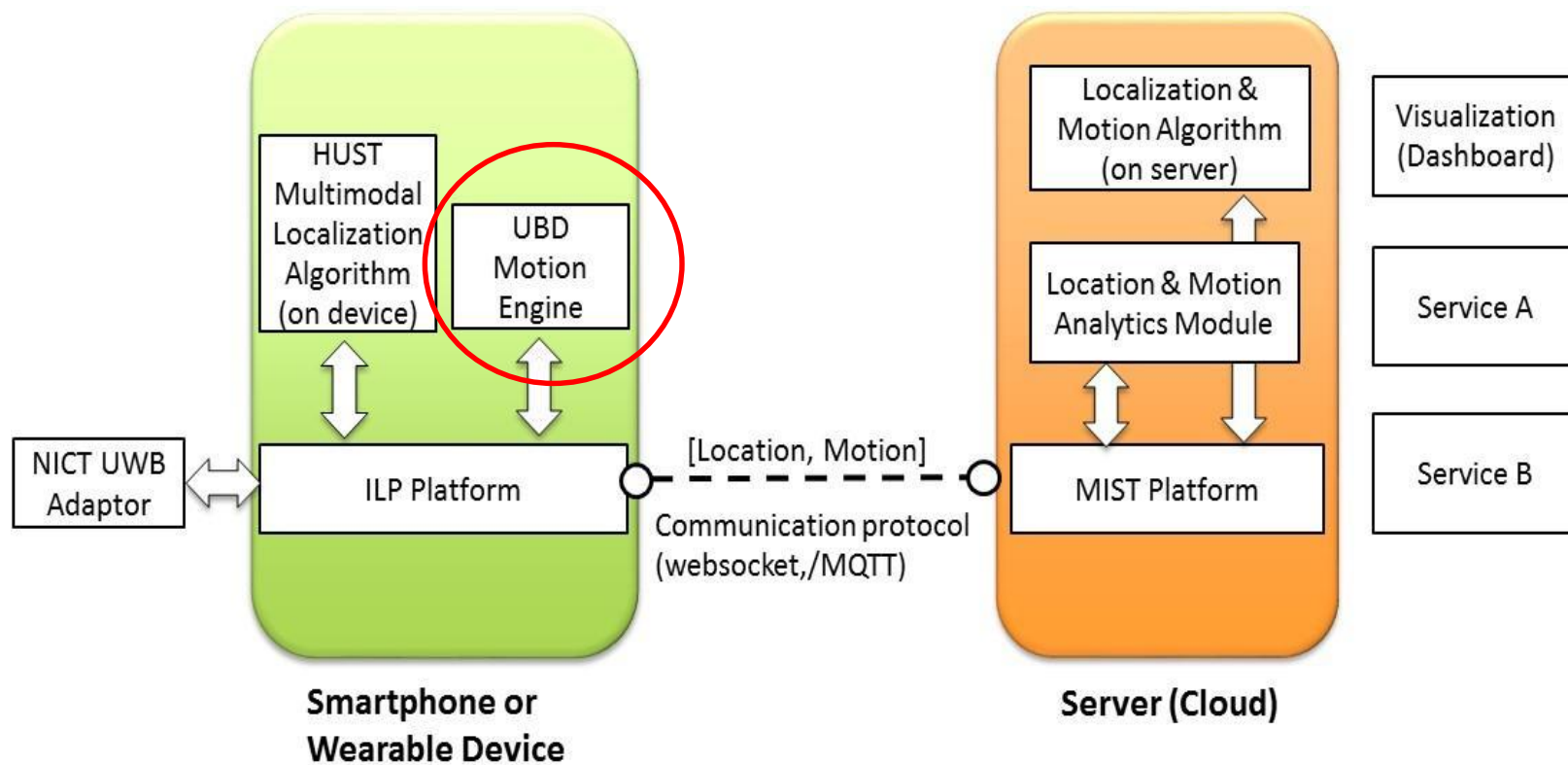


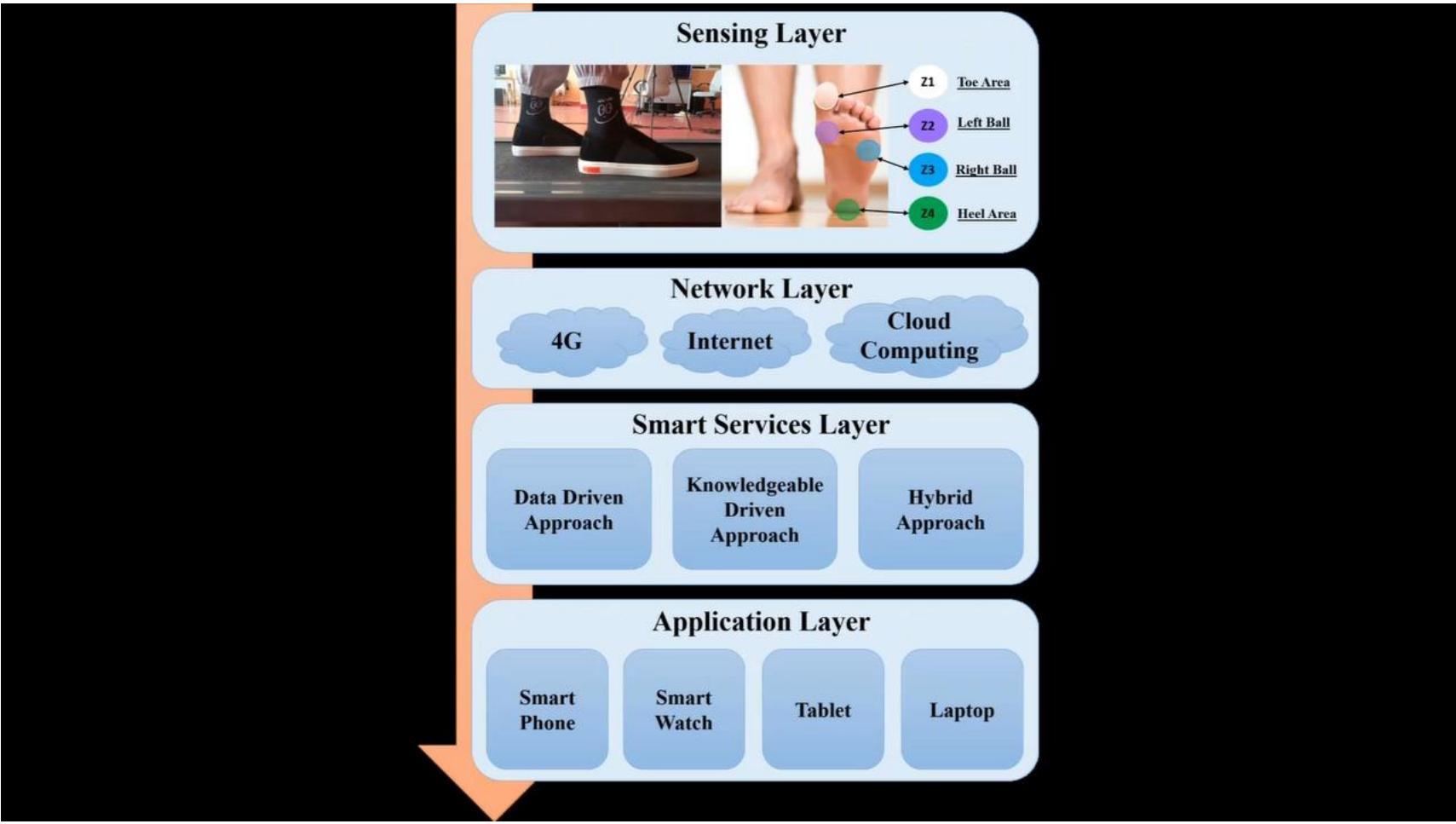
Navigation Test

- Accuracy ~ 5 meter
- Noisy due to many disturbances (suspect from hotspots)

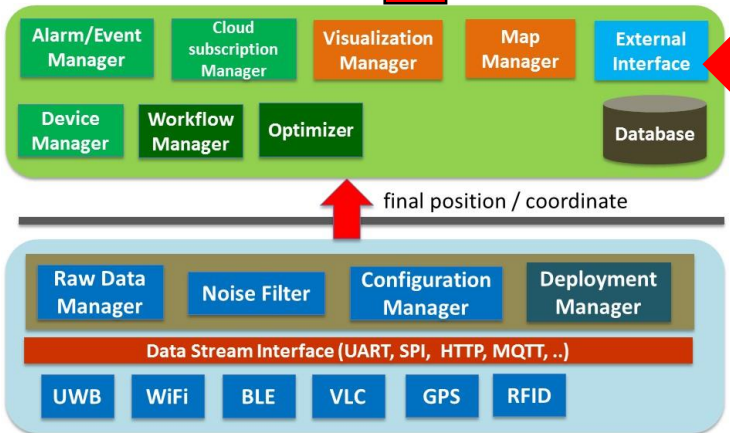
UBD Motion-Health Engine

- To remotely monitor public health and safety
- Real-time biofeedback control

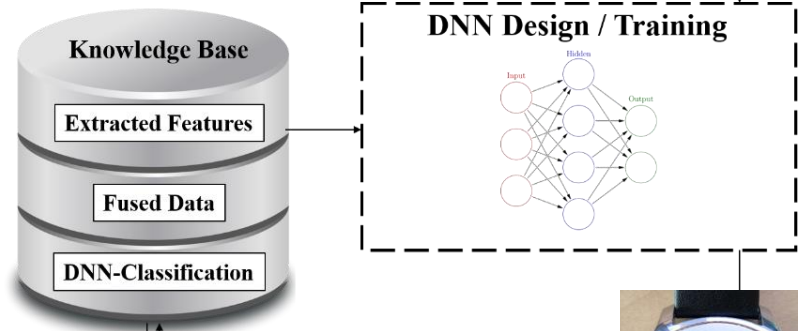
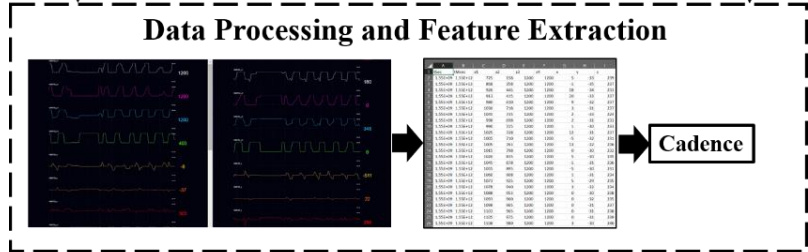




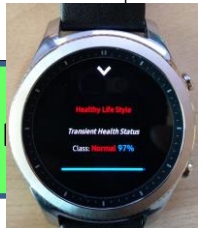
ID1234: Real-time Location + Health



MIMOS Location Platform



Application/Visualization

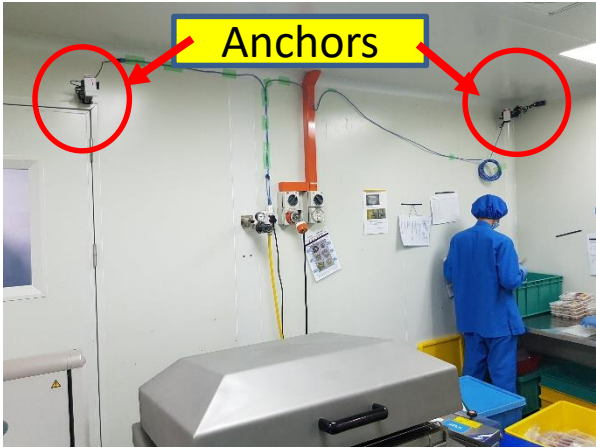


Store time series result

No:	Paper title:	Author names	Affiliation	Conference name:	The date of the conference	The venue of the conference
1	Performance Analysis of Enhanced Delta Sampling Algorithm for BLE Indoor Localization	David Chieng, Alvin Ting, SC Ng, Mohd Faiz, Idawaty	MIMOS, UPM	2 nd Future Smart Cities (FSC 2019)	5-6 Nov 2019	Xiamen University, Sepang, Malaysia
2	Master-Slave IoT for Active Healthy Life Style	S. M. Namal Aroscha Senanayake, Nursyuhada Hj Kadir, Minoru Sasaki, Muhammad Syaiful Amri Bin Suhaimi	UBD, GIFU	12th IEEE International Conference on Human System Interaction (HSI 2019)	25-27 Jun 2019	Richmond, Virginia, USA

No:	Paper title:	Author names	Affiliation	Journal name:	The publisher of the Journal	The volume number and Pages
1	Proposals and Implementation of High Band IR-UWB for Increasing Propagation Distance for Indoor Positioning	Huan-Bang Li, Ryu Miura, Hisashi NISHIKAWA, Toshinori KAGAWA, Fumihide KOJIMA	NICT	IEICE Transactions on Fundamentals of Electronics Communications and Computer Sciences	IEICE	E101.A(1):185-194, DOI: 10.1587/transfun.E101.A.185

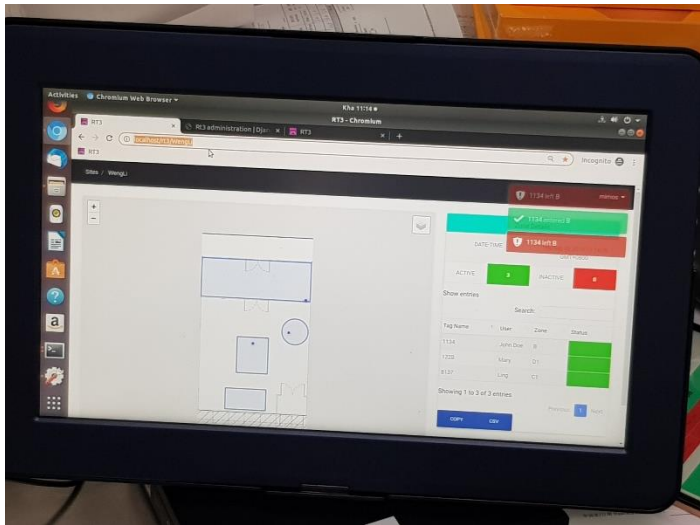
No:	Patent Title	Inventor names	Affiliation	Patent/Application Number	Patent Office
1	Radio Receiver	Huan-Bang Li et. Al.	NICT	US 10,277, 263 B2	USPTO
2	System and Method for Real-Time Object Tracking	David Chieng et. Al.	MIMOS	PI20180002075	MyIPO



Production Floor



IR-UWB Tags



Dashboard



Job Entry Terminal



Production Floor



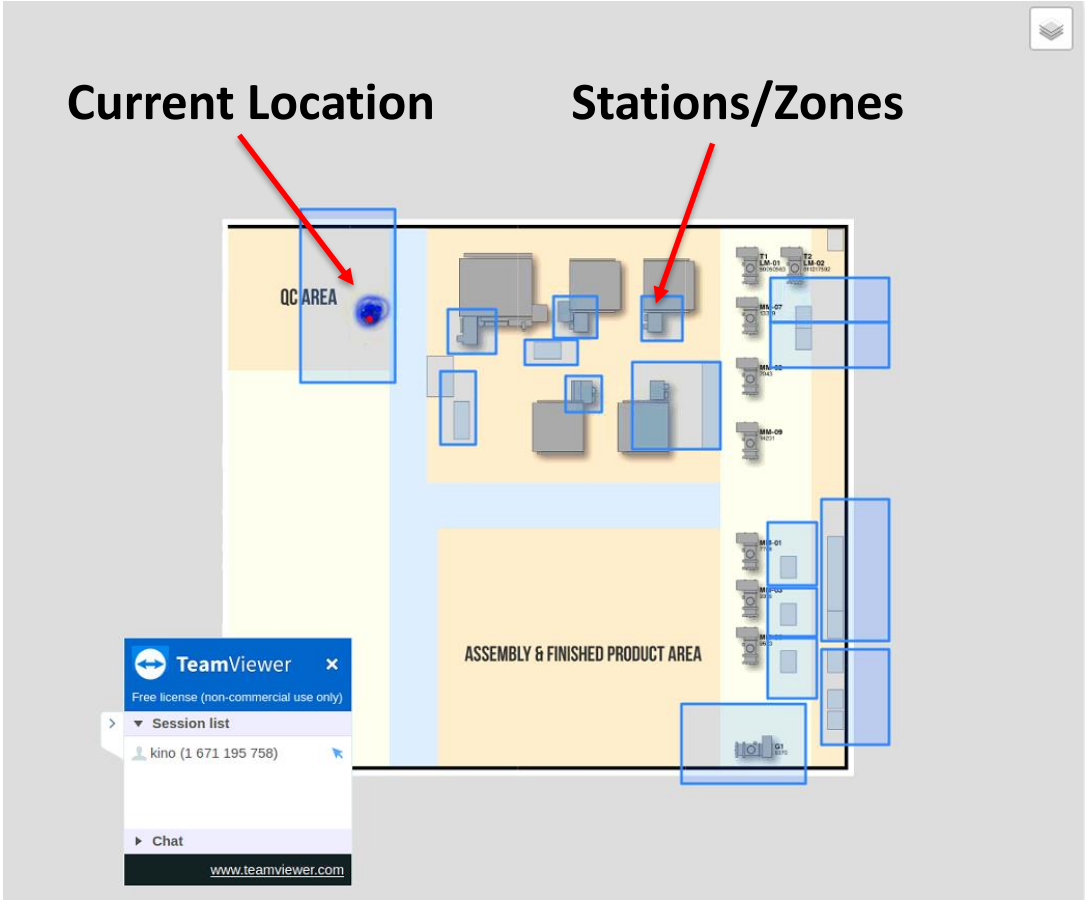
Production Floor



Tag Charging & Assignment Station



Trial Run



Zone Details			
DATE-TIME		Mon Nov 18 2019 09:38:23 GMT+0800	
ACTIVE	10	INACTIVE	0
Show entries			
Search: <input type="text"/>			
Tag	Tray ID	Station	Status
1AB8	Tray-07	Check In/Out	
4DB1	Tray-01	Check In/Out	
4E33	Tray-05	Check In/Out	
5B10	Tray-02	Check In/Out	
5C96	Tray-10	Check In/Out	
8204	Tray-09	Check In/Out	
8210	Tray-03	Check In/Out	
C2B6	Tray-06	Check In/Out	
C625	Tray-08	Check In/Out	
D62B	Tray-04	Check In/Out	
Showing 1 to 10 of 10 entries 1 row selected			
COPY		CSV	

Tag zone, status

Monitoring Dashboard



Talk about IoT and Location Technologies,
Sarawak Energy Headquarter



Demo in Industrial Events

Real Time Tracking

- NICT setup IR-UWB Testbed in MIMOS
- MIMOS developed UWB applications for tracking
- Various pilot trials in progress

Self Navigation

- MIMOS and MICA co-develop a geolocation algorithm
- Performed a trial in VINCOM mall, Hanoi

Motion-Health

- Health status (based on gait movement of local subjects aged 20-56) can be classified through integration of Neural Network and Cloud computing
- Health status of selected subject can be visualized in “near real-time”

- To merge Location and Health real-time data at the cloud (AWS) and visualized on MIMOS dashboard (MIMOS & UBD)
- To carry out more public and industrial trials lead my MIMOS
- To conduct a **“Smart Health & Localization Technologies”** workshop to share knowledge and experiences for research community in this area in KL, March 2020 (All)

Thank you
Questions?