

Two Heads are Better than One, is also True for Indoor Localisation

Indoor Positioning System for Social Animals

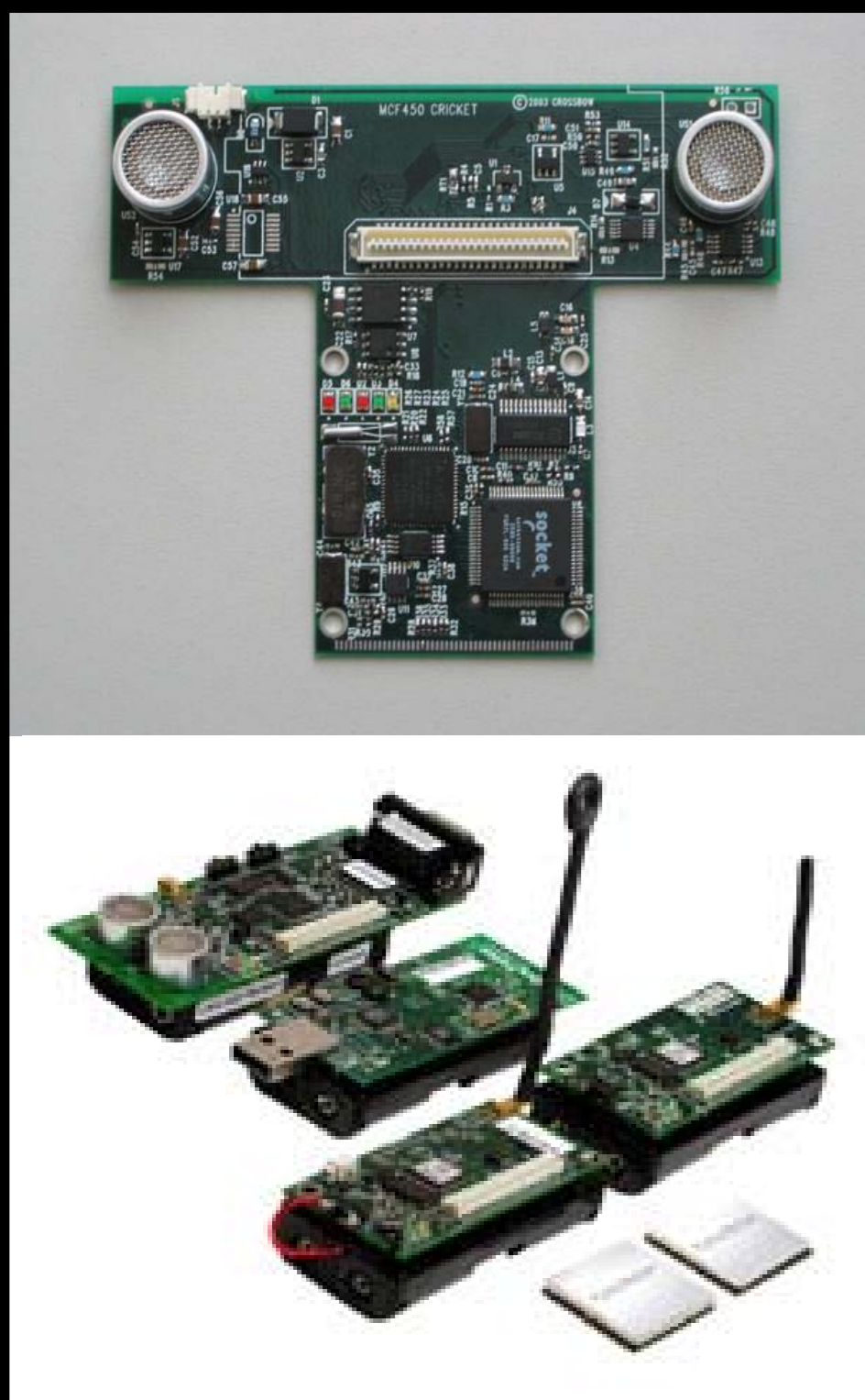
Jung-hyun Jun, Jason Gu, Lijuan Wang, Sunardi

Abstract

Our human society spends majority of their time indoors. This indoor space is confined with limited number of entrances, rooms, and narrow passages. This unique indoor environment limits the movement of users and their potential locations and consequences are they encounter more frequently and their locations are deterministic with respects to each other's location.

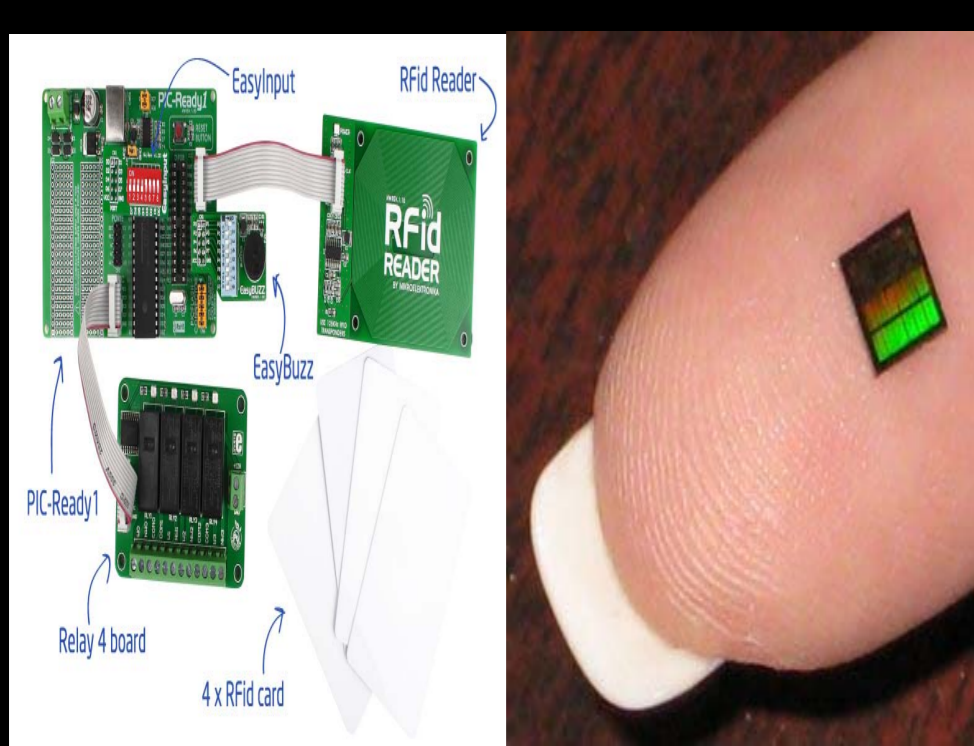
But, existing indoor localisation solutions are single user oriented as if you are in the labyrinth. This means all the users compute their own locations and never communicate with each other, even if they are in each other's vicinity. Here, we propose an indoor localisation method where users share their last localised point, walking duration, and turning times through well-established network infrastructures like Wi-Fi. This method only utilises estimated walking durations from acceleration sensors and (binary) turning information from gyro sensor without any specific information about turning angles.

Range-based



Cricket and Bat system :

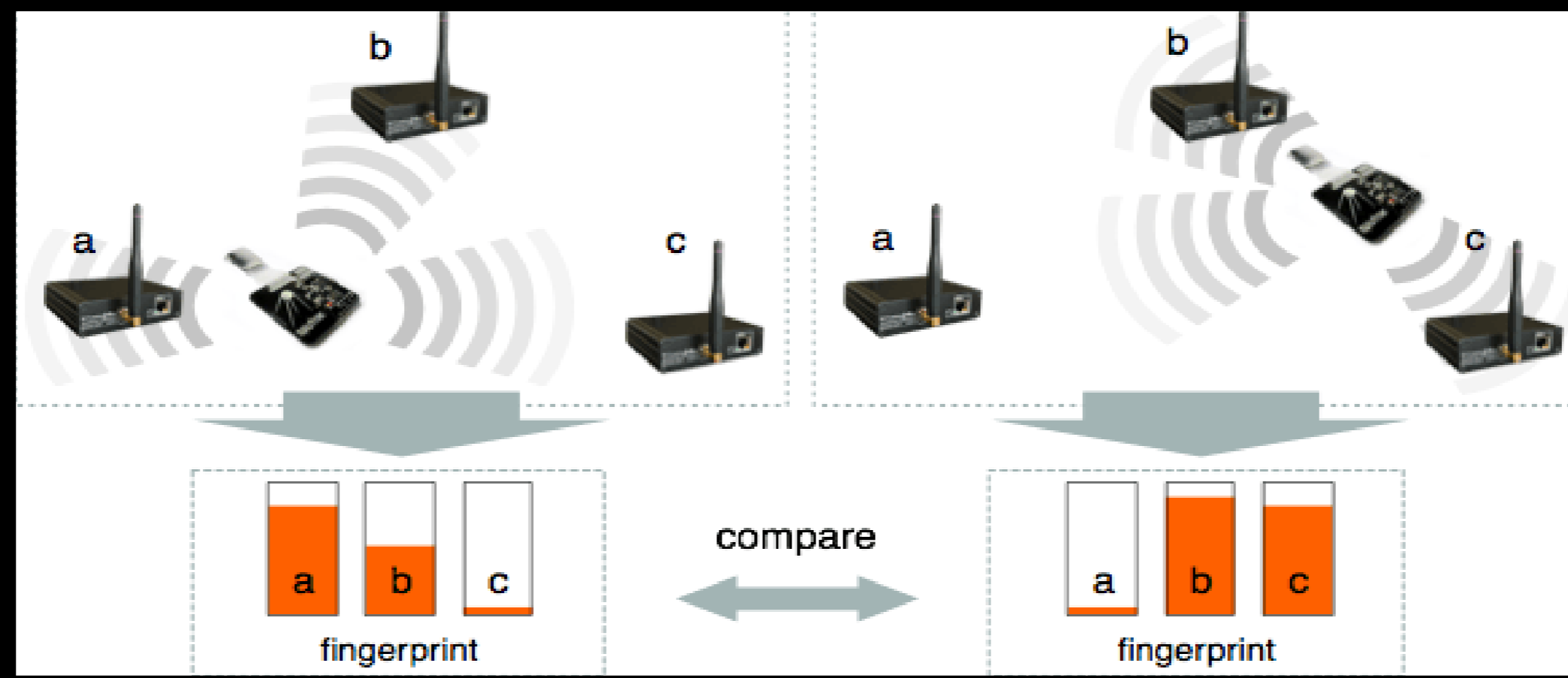
- RF and ultrasound technologies
- Estimate distance based on angle-of-arrivals



LANDMARC and Active Badge:

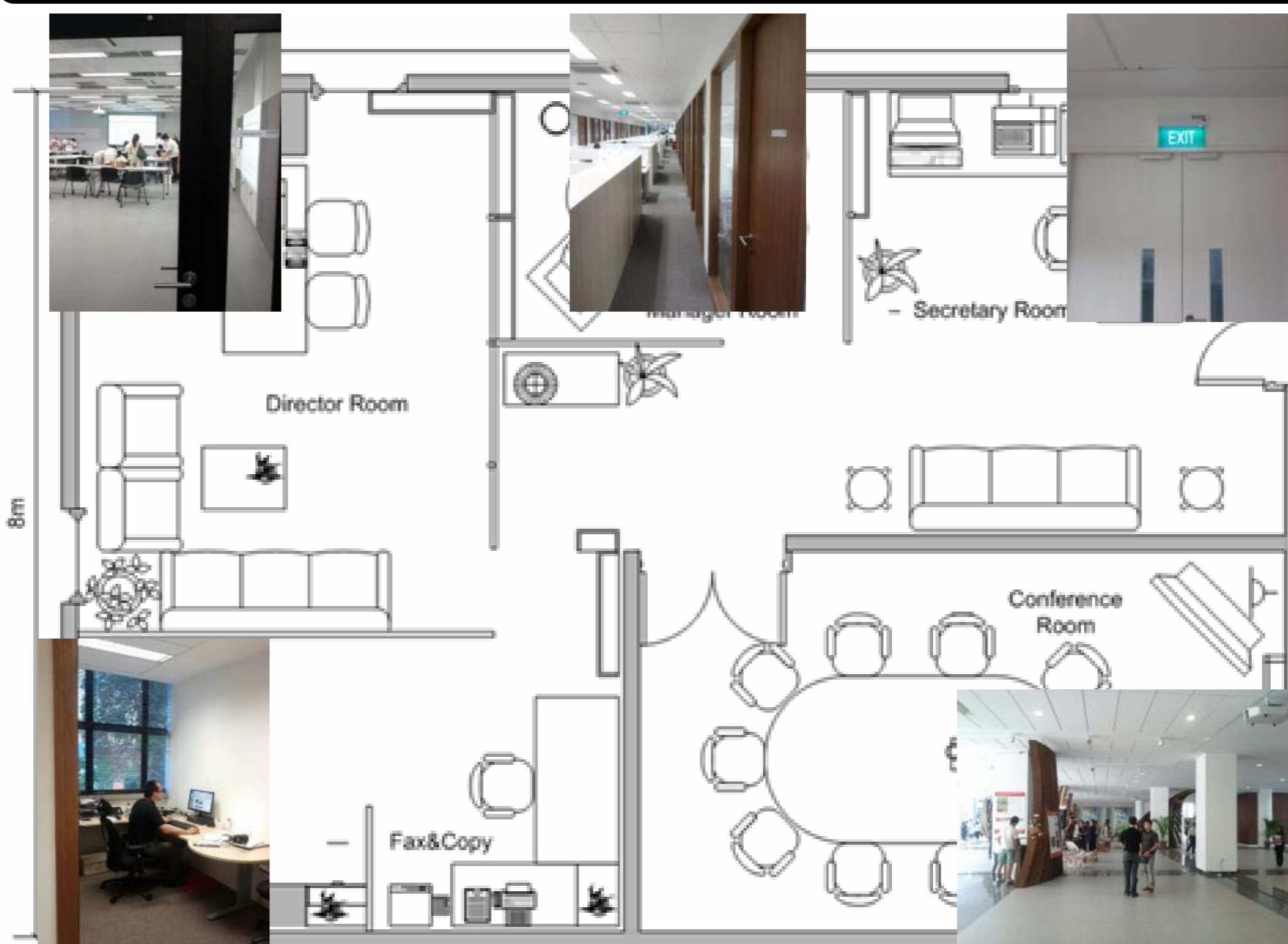
- Active RFID technologies
- Geo-location Tag is used to reference RFID scan locations

Signal-fingerprinting



RADAR and Horus :

- Received signal strength surrounding images and acoustic sound for building signal map of indoor space
- Training phase to construct the signal fingerprints for every location.



Dead-reckoning



FootSLAM and NavShoe

- Foot mounted IMU system
- Sensor fusion technology
- Particle filter predicts current location

