Wearabouts

Semantic Localization Through Wearable Devices

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Localization Services

Rather than the absolute positioning of systems like GPS, semantic localization specifies position relative to something else. For instance, people can be located relative to rooms in a building.

This type of localization can provide a number of useful services:

- Building Controls
- Indoor Navigation
- Finding People and Things

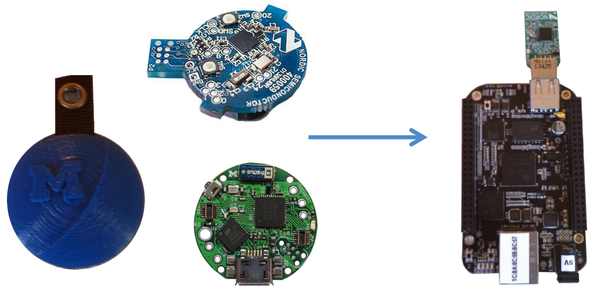
Wearabouts provides room-level localization of people.

Leveraging the Wearables Revolution

Wearable devices are quickly growing in popularity. These devices are more tightly tied to their users than smartphones or laptops, and even incentivize constant use by monitoring user health.

One property shared among all wearables is the need to communicate. Scanning infrastructure can detect devices by their communications.

System Architecture



BLE Devices → BLE Scanner → Wearabouts Controller → Location-Based Services

BLE Scanning

Bluetooth Low-Energy has become the leader in wearable communications, and is the communication scanned for by Wearabouts.

BLE devices use advertising packets to broadcast their presence. Each packet includes a unique device ID and an RSSI value. Advertisements are frequent, on the order of one packet per second.

Simple hardware can continuously scan for BLE device advertisements. For each advertisement, location of the scanner, time, unique ID, and RSSI are sent to the cloud.

While the current version of Wearabouts relies on deployed infrastructure, we foresee Bluetooth Low-Energy connections formed by common Access Points in the near future.

Wearabouts Controller

The central controller exists on the cloud and transforms data collected from various scanners into a single location estimate for each person.

The Wearabouts controller must make decisions based on criteria such as:

- How recently has a packet been seen?
- What is the RSSI at each scanner detecting the device?
- In which room was the device most recently located?

Any wearables that are used for detection must have their unique ID registered in the system along with their owner. If one device is registered in the system, detection of other devices could be automated through correlation of detections.

Sponsored by the TerraSwarm Research Center, one of six centers administered by the STARnet phase of the Focus Center Research Program (FCRP) a Semiconductor Research Corporation program sponsored by MARCO and DARPA.

Berkeley, CA
October 29-30, 2014