Indoor Localization for Internet of Things and Smart Entities

How localization for IoT can help Singapore become 'smart nation'?

Faheem and Ioannis Papapanagiotou
CNIT

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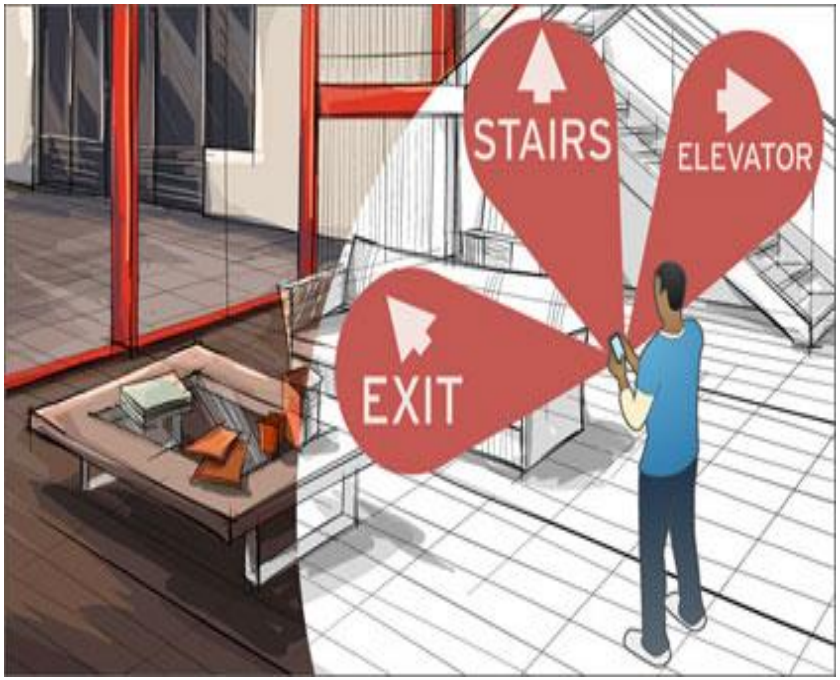
Overview

- What is indoor localization?
- Why indoor localization for IoT?
  - Contextual Aware Services.
  - Indoor Navigation.
  - Interactive Environment.
  - Energy Efficiency.
- Our Research!

What is indoor localization?

- Obtaining a user's location with high accuracy within a building.
- Technologies like GPS work in outdoor environments and the accuracy of GPS is 10 meters.
- Indoor localization requires sub-meter accuracy (preferably 10cm).
  - Micro-location.
  - Geofencing



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Why indoor localization for IoT?

- Position of a user inside the IoT equipped smart buildings can be used for
  - Contextual Aware Services.
  - Indoor Navigation.
  - Interactive Environment.
  - Energy Efficiency.
- Example use cases
  - Airports.
  - Libraries.
  - Museums.
  - Hospitals.

Our Research

- Proximity based Services
- Designing algorithms for indoor localization.
  - iBeacons.
- Applying control theory based filters for enhancing performance.
- Collaboration with
  - North Carolina State University
  - The University of Iowa
- Garnered attention from
  - Walmart
  - IBM
  - Museum of Life and Science, Durham NC.
  - Different researchers!

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Our Research

- In less than a year
  - A journal paper accepted in IEEE Internet of Things Journal “Micro-location for internet of things equipped smart buildings”.
  - A conference paper accepted in Globecom 2015 “Enhancing iBeacon based micro-location with particle filtering”.
  - A conference paper under review at Globecom 2015 workshops “A cloud based iBeacon Internet of Thing solution”.

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Our Research

- In less than a year
  - Implemented an IoT scenario at James B. Hunt Library at North Carolina State University (NCSU) https://www.youtube.com/watch?v=AwckTkpN4-Y
  - Open sourced our code on github https://github.com/ipapapa/IoT-MicroLocation

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Questions!

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