IoT Localization Using Software Defined Radios

Master Thesis project at RISE SICS, Kista.

Description of the units
The Networked Embedded Systems (NES) group at RISE SICS is a part of the Computer Systems Laboratory. The current research focus is on the Internet of Things. Among the group's key technologies are the Contiki operating system, uIP stack, ContikiRPL, SICSLoWPAN, SICS th Sense, and lightweight implementation of IPsec and DTLS. The NES group conduct projects together with industry and academic partners from Sweden and across the world.

Thesis description
Indoor localization is an important IoT application. Examples of such are localization of hospital equipment, mine vehicles, and industrial tools. The most common approach to indoor localization, is currently using fingerprinting techniques based on received signal strength. Examples of other techniques involve triangulation or multilateration.

In this thesis you will investigate how such techniques can be improved if more detailed information of the signal is available. For this purpose, you will use Software Defined Radios (SDRs).

You will be required to:

- Study the theory and state of the art of different indoor localization techniques
- Set up an SDR environment able to capture low-level signals and process them
- Implement at least one localization approach using the SDR setup
- Document the results as a thesis document

Competence
We are looking for a good student with good embedded programming skills, and with interest in IoT, who have fulfilled the course requirements. Good skills in spoken and written English are required.

Applications should include a brief personal letter, CV , and recent grades. In your application, make sure to give examples of previous programming or other projects that you consider relevant for the position. Candidates are encouraged to send in their application as soon as possible. Suitable applicants will be interviewed as applications are received.

Start time: As soon as possible

Where: RISE SICS Kista, Stockholm

Please contact
Niklas Wirström
E-mail: niklas.wirstrom@ri.se
RISE SICS AB
Networked Embedded Systems Group,
Electrum Building, Isafjordsgatan 22SE-164 40 Kista,
Stockholm

ID: 1576