



Thesis Title: *IoT Localization: Asset Tracking With Long Range Sub-GHz Radios*

Description of the units:

The Networked Embedded Systems (NES) group at SICS Swedish ICT 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, SICSthSense, 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:

Asset tracking and localization is an important IoT application. Examples of such are localization of hospital equipment, mine vehicles, and industrial tools. Current asset tracking systems are typically based on short range RF technologies in the 2.4GHz or 5GHz bands, which requires a relatively high number of deployed anchors. Using radios with longer ranges, on the order of hundreds of meters, could be used to either decrease the number of required anchors, or increase the number of anchors within range at a given location.

The goal of this master thesis is to investigate the feasibility and potential benefits of using IEEE 802.15.4g compliant radios. You will be required to:

- Study the theory and state of the art of different localization techniques applicable to asset tracking (e.g range and fingerprint based techniques.)
- Implement at least one localization approach for a platform with sub-GHz IEEE 802.15.4g radios (e.g. Zolertia RE-Mote.)
- Evaluate the implemented approach(es).
- 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: SICS Swedish ICT Kista, Stockholm

Contact person:

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