

# Heterogeneous IoT Networks for Remote Health Monitoring

## Master thesis project at RISE SICS Västerås.

### Description

This thesis work is defined in the scope of the ESS-H research profile (Embedded Sensor Systems for Health Research Profile, [http://www.es.mdh.se/projects/324-ESS\\_H](http://www.es.mdh.se/projects/324-ESS_H)) and ecare@home project (<https://ecareathome.se/>). These projects aim at providing remote health monitoring of patient through wireless medium.

There is a need to utilize both environmental and physiological sensors in health monitoring applications in order to get more accurate information. Thus, it is mandatory to employ various types of sensing devices that measure different parameters while being able to communicate. It is challenging to maintain network reliability while employing various radios with different protocol stacks and standards.

### Problem statement

In this Thesis, we are focusing on the problem of implementing a heterogeneous network with Bluetooth and IEEE 802.15.4 enabled devices for remote health monitoring.

### Main outcome

Implementing a test bed that models a heterogeneous network with different radio technologies and evaluate the network performance in terms of network reliability.

### Tasks

- Run 6TiSCH protocol in an IoT operating system (e.g., OpenWSN) on a platform (e.g., OpenMote/Telosb motes) using IEEE 802.5.4 radio
- Connecting a network of Bluetooth-enabled Shimmer sensors to a network of OpenMote sensors through a Gateway, where the Gateway is a laptop collecting measurements
- Evaluating network reliability under various network size and link conditions through extensive experiments

This thesis is suitable for 1-2 students.

### Qualifications

To be successful in this thesis work the candidate(s) would need the following:

- MSc studies in Computer Science or similar area.
- Excellent programming skills in C/C++
- Good knowledge of wireless communication systems
- Be fluent in English.

### Contact persons:

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### Application

To apply please send your CV along with the list of courses you have taken and their grades to [hossein.fotouhi@mdh.se](mailto:hossein.fotouhi@mdh.se) or [ali.balador@ri.se](mailto:ali.balador@ri.se). In your CV provide a short description of previous projects that you have done.