



## Thesis Topic

**Roaming Models for the Internet of Things (IoT)**

## Motivation

Emerging IoT connectivity technologies such as low-power wide-area networks (LPWAN) are expected to connect more than half of the IoT devices on our planet with applications in several vertical sectors (e.g., asset tracking, smart cities, transport, energy, healthcare, agriculture).

LoRaWAN is currently one of the most widely deployed unlicensed LPWAN technology, which provides simple energy efficient connectivity and is supported by a robust infrastructure.

An interesting challenge in LoRaWAN is the roaming of IoT nodes between different networks that would enable large-scale deployments to support use cases at (cross-)national level.

## Tasks

The thesis will address methods, models and tools to support the roaming in LoRaWAN. The latest LoRaWAN specification provides support for the roaming capability between different operators of LoRaWAN networks; however, the need for roaming agreements between operators creates administrative overhead that hinders the scalability of the solution. The student will survey the literature on roaming techniques in wireless networks as well as the LoRaWAN roaming capability, and propose a new roaming model, developing his/her own approach taking into account application use cases as well as scalability and performance requirements. He/she will also have the opportunity to work in a lab on real equipment.

## Prerequisites \*

**Mandatory:** Good knowledge about computer science and embedded systems. Good grades and high interest.

**Recommended:** Bachelor degree, courses about programming, modeling and simulation.

## We offer you

- Preliminary meeting to clarify objectives and requirements.
- Guidance, support and study materials (slides, lecture notes, technical books, research papers, etc.) on related topics.
- Modeling and simulation tools as required.

## Time frame

- (to start as soon as possible)

## Supervisor(s)

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