Open Thesis / Project
# Bringing Cross-Technology Communication to Smartphones

Motivation

Bluetooth Low Energy (BLE) and IEEE 802.15.4 are the two most widespread wireless technologies used for the Internet of Things. Due to the heterogeneity of those technologies it is not possible for co-existing IoT devices to communicate with each other or to share information.

In order to allow a communication between devices employing incompatible wireless technologies, a mechanism called *Cross-Technology Communication* (CTC) can be used which aims to use specific interference patterns to convey information between different wireless standards. We have developed a CTC scheme that allows a direct communication between BLE and IEEE 802.15.4 devices by encoding information into precisely timed energy bursts. The scheme was integrated into the open source operating system Contiki.

The aim of this thesis/project is to bring *CTC to smartphones* (Android), using the already existing Contiki implementation of our scheme. This will open a variety of new applications such as controlling ZigBee devices via smartphones.
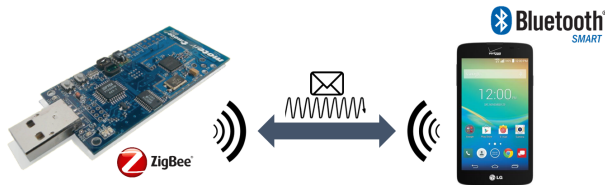
Thesis Type

Master Project / Master Thesis

Target Group

- Students of ICE / Telematics;
- Students of Computer Science;
- Students of Electrical Engineering.

Goals and Tasks

- Development of an Android app (integrating our CTC scheme);
- Detection of the presence of other communications on the channel (e.g., RSSI);
- Transmission of BLE packets of arbitrary length;
- Analysis and evaluation of the performance of the implemented communication scheme.

Required Prior Knowledge

- Solid background in android app development;
- Problem solving skills;
- Excellent programming skills;
- Interest in low level driver software.

Contact Person

- DI Rainer Hofmann
  rainer.hofmann@tugraz.at
- Dr. Carlo Alberto Boano
  cboano@tugraz.at

Institute for Technical Informatics
Networked Embedded Systems Group

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