Open Thesis

Towards Reliable BLE Communication in Industrial Applications

Motivation

Bluetooth Low Energy (BLE) is becoming increasingly more popular to wirelessly connect devices to each other. This trend is not limited to consumer electronics, but can also be seen in harsh environments, such as automotive workshops and garages, where embedded devices need to communicate with a technician's laptop. AVL DiTEST (www.avlditest.com/) is a Graz-based company creating such embedded measurement and diagnostic devices that are used in harsh environments.

In this project, we are working in cooperation with AVL DiTEST towards exchanging their current device-to-device communication with BLE. To ensure a high user experience, it is essential that the BLE communication between embedded device and laptop works reliably and does not introduce significant communication delays. Furthermore, it is vital that the BLE communication between embedded device and laptop is compliant to the BLE specification to ensure interoperability.

Target Group

Students of ICE/Telematics, Computer Science, and Electrical Engineering.

Thesis Type

Master Project/Master's Thesis.

Goals and Tasks

The main goal of this project is analyze, implement, and evaluate different possibilities to connect AVL DiTEST systems via BLE to a technicians laptop. The tasks to be performed include:

- Investigate different approaches to exchange data between devices over BLE connections.
- Create prototype implementations of the different BLE connectivity approaches.
- Experimentally evaluate the approaches and discuss their advantages and drawbacks.

Required Prior Knowledge

- Excellent programming skills (C);
- Good experience with embedded systems;
- Problem solving skills and hands-on attitude;
- Good understanding of both HW and SW;
- Knowledge of Bluetooth Low Energy is a plus.

Used Tools & Equipment

- C/C++
- Bluetooth Low Energy (BLE)

Cooperation Partner

This thesis is part of a cooperation between TU Graz and AVL DiTEST and can be paid.

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