

Master Thesis: Implementation of 5G-IoT Use-cases: Predictive Car maintenance

Background:

The future Internet of Things (IoT) networks will be designed to allow long range communications at a low data rate among devices (connected objects), such as sensors operated on a battery to communicate small bundles of delay sensitive data. To meet the requirements set forth by such networks, the Third Generation Partnership Project (3GPP) has introduced a new radio access technology called Narrowband Internet of Things (NB-IoT) which provides extended coverage, high capacity, low throughput, reduced device processing complexity and long battery lifetime.

NB-IoT is a long-term evolution (LTE) variant designed specifically for IoT. LTE already has a global footprint and thus supporting and driving IoT adoption through NB-IoT is considered a promising solution. The aim of this thesis is to prototype the use-case of predictive car maintenance system using NB-IoT and to demonstrate the potential of NB-IoT technology. At the same time, address some of the main challenging issues of today's car maintenance systems.

The focus of this thesis is to first configure already existing NB-IoT OBD dongles with appropriate cloud platform. Perform field trail and collect data and display on android app using smart predictive solution for car maintenance.

Project Description:

In this thesis, the candidate will be involved in establishing the connection of NB-IoT OBD dongles with the server and initial data collection. Perform field trail and display the results on android based application. Lastly, a predictive car maintenance solution based on collected data will be proposed and evaluated.

Responsibilities:

- Field trails and cloud server establishment.
- Android/Apple app for data display.
- Predictive algorithms for car maintenance.
- Thesis writing and documentation

Requirements:

You have a Bachelor degree in electrical engineering or computer science. You have a Master degree (or undergoing) in electrical engineering or computer science. You are familiar with general concepts of wireless communication, STM32 processor, cloud server, App develop (either android or apple).

Learning Outcome:

Candidate will gain an in-depth knowledge of IoT and gain hand-on experience on Arduino programming, cloud server establishment, data analysis and interpretation, predictive algorithms.

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