Thesis project proposal – Wireless audio streaming in an IoT context

2015–12–07

1 Background

The Internet of Things (IoT) concept means that ordinary devices is connected to the Internet for extended control and ease of use. Some forecasts estimates the number of connected devices by 2020 to between 30 and 70 billion. IoT is one of the technology areas where Altran expects the largest growth in business opportunities in the next few years. Therefore Altran wants to invest in knowledge in this area. For a student, knowledge in this area is advantageous for the same reason.

2 Goal

Altran wants the student to:
- Investigate what state of the art communication techniques that exist in an IoT context and which techniques that are suitable for which application area (e.g. low power sensors, or wireless audio streaming).
- Propose a base for a general IoT communication platform, which can be used to implement several different communication techniques.
- Implement a communication protocol for wireless audio streaming on this platform.

A system capable of transmitting audio data to a wireless speaker is to be realised in order to validate the findings.

If there is time, capability for multimedia playout in the speaker system is to be implemented.

3 Division of sub-tasks

The task can be divided in various sub-tasks, or phases:

1. **Literature study of communication techniques**.
2. **Selection of a communication platform**.
3. **Design phase**. In this phase the student is to investigate and decide what components the network for wireless audio streaming should be constructed upon, based on the network criteria.
4. **Implementation phase**. Here the student is to implement the network she designed in the previous phase and test it.
5. **Content phase**. This is where the student expand the capabilities of the network to audio streaming.

For all phases, the student is to document the findings of the investigation and provide concrete arguments for using certain technologies over others.

Phases 1-4 are expected to be complete for the time allotted (20 weeks at 50%).

4 Description of project

This project involves computer networking, multimedia streaming and encoding, distributed system design, and hardware level programming. A student working on the project should be knowledgeable in these areas.

Altran will provide the hardware needed, e.g. two microcontrollers with performance similar or equal to Raspberry Pi 2, along with compatible Wi-Fi adapters. Altran will also provide a room at their office and the supervisor at Altran will be available Monday, Tuesday and Fridays, from January to June. Katarina Asplund is requested to supervise from the university.

5 Contact

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