Wireless Networking

Course code: CS4222/5422, Assignment #1

Important Instruction: This assignment has to be conducted with the members of the registered group. Please note that ANY member of the group can demonstrate the assignment during the tutorial to be held in the Week. Hence, it is not required that every member of the group does demonstrate the particular assignment.

Objective of the assignment

The objective of this assignment is to familiarise students with programming on the Texas Instruments SensorTag Platform using the Contiki operating system. Additionally, this assignment provides students with their first opportunity to collaborate as a team.

Introduction

The Texas Instruments Sensor Tag CC2650 is an example of a wireless embedded systems or Internet of Things platform. It is equipped with ten sensors, including, to measure light, acoustic emissions, motion, magnetic field, temperature. It also supports wireless networking through the support of standard of BLE and ZigBee. Nonetheless, this platform is designed to operate on limited energy, for example, operating for prolong period of time on small batteries like coin cell. Consequently, it is very constrained with limited computation and memory resources available on the microcontroller.

As a result, these embedded platforms do not operate conventional operating systems such as Windows or Linux. Instead, for these platforms, use operating systems like Contiki. It is an open-source operating system initially developed in Sweden by Adam Dunkels, and it is supported by an community of developers. It facilitates wireless networking, supporting various stacks and standards across a wide range of platforms, including the TI SensorTag.

ContikiOS: https://github.com/contiki-ng/contiki-ng

Installation and setting-up the environment

You can follow the instructions as formulated by the teaching assistants for installation of ContikiOS, compilation and programming of the sensor tags.

Instructions for Windows: Please find below

https://weiserlab.github.io/wirelessnetworking/Assignment1_Windows.pdf

Instruction for MAC/Linux: Please find below

https://weiserlab.github.io/wirelessnetworking/Assignment1_maclinux.pdf

Grading and Demonstration

Please demonstrate to the teaching assistants that you have successfully installed ContikiOS and can successfully program the sensor tag device.

In the particular assignment, you should be able to comple and execute the "Hello-World" program. In particular, please change the program to output the names of all the members of your group.

Deadline for demonstration and weightage towards grades

Any member of the group can demonstrate the assignment to the teaching assistants during the tutorial session 4 (Starting 19th February 2024) or the tutorial session 5 ~~(Starting 26th February 2024)~~. Please note that if you are unable to complete the demonstration during the designated tutorials, you can email your teaching assistant for an appointment.

There will also be a late penalty of 10% for demonstrating the assignment after the Tutorial Session 5. The assignment contributes 5% to overall grade.