Project on SimpleLink CC1310 Sub-GHz Wireless Microcontroller LaunchPad Development Kit

Overall Project Description

Internet of Things (IoT) spans a large number of applications and technologies. The CC1310 sub-GHz wireless microcontroller offers combined long-range connectivity and low-power consumption, which can find a number of useful applications. As part of EE/TE 4367, we are offering a hand-on project that will expose the interested students to this technology. Teams of two students are welcome. Students who do not have a student colleague to work with will be assigned to a team by the instructor. The project consists of three main milestones. Each milestone builds on top of the tasks completed as part of the previous milestone, and it is therefore important that the student team completes the assigned tasks in a timely manner.

The three milestones are:

1. Milestone 1: the team will use two CC1310 LaunchPad development kits to assess the wireless channel quality subject to using the on-board built-in (PCB) antenna. The team will develop a procedure for estimating the radiation pattern of the PCB antenna leveraging the LaunchPad ability to measure the RSSI.
2. Milestone 2: the team will use two CC1310 LaunchPad development kits to measure the packet error rate of the wireless channel under varying conditions. Input parameters for the experiment include the distance between the two LaunchPads, the transmitted power level and the selected bit rate (three rates will be tested).
3. Milestone 3: the team will devise and implement a procedure for the LaunchPad to autonomously determine the optimal power and transmission rate to be used. Input parameters include distance between the Launchpad, orientation of the antenna, ground and air condition.

Deadlines	For Full Credit	For 90% Credit	For 80% Credit
Milestone 1	See table on main page	See table on main page	N/A
Milestone 2	See table on main page	See table on main page	N/A
Milestone 3	See table on main page	See table on main page	N/A

The project score can be used to replace any written exam and improve the overall score of the class.

Teams are encouraged to complete these project assignments as early as they can, ahead of the given deadlines. Teams successfully completing the three milestones will be invited to join a research team to work on the design and implementation of a bridge architecture combining a CC1310 LauchPad with a LTE modem.