LESA Center Summer URP Remote Research Opportunity

Title: *Bluetooth Mesh Networking*
Duration: **Summer 2020**

Description / Responsibilities

This is a remote URP position that will require daily electronic contact with the technical supervisor for the position. This URP research opportunity is currently available for pay or for course credit. The terms of this opportunity are subject to any changes in the university's pandemic protocols in response to COVID-19. .

Bluetooth is a technology for short-distance wireless communication intended to replace the cable(s) connecting portable and/or fixed electronic devices. While Bluetooth communication has been around since the late 1990s, a new form of the technology focused on lower power consumption, lower complexity, and lower cost referred to as Low Energy (LE) was first outlined in Version 4.0 of the Bluetooth Core Specification in 2010. An additional mesh networking solution is a subset of BLE and was first specified in 2017.

The overall goal of the project will be to implement a LE Bluetooth mesh network and evaluate its data transferring performance. The research tasks for this URP effort include:

- Literature search about Bluetooth protocols and available libraries;
- Analysis of the available hardware (Arduino, Sparkfun, Nordic, RaspberryPi, etc.);
- Testbed assembly from multiple Bluetooth nodes and master device;
- Modification of Bluetooth protocol to make it be discovered on Bluetooth network as a LESA device;
- Changing Bluetooth protocol to be able to transfer custom data;
- Prepare system evaluation protocol for data transferring speed, distance and robustness;

Applicant Requirements

- **Rising junior or senior ECSE or CS student**
- Demonstrable experience & knowledge of Bluetooth protocols and mesh networks
- Microcontroller firmware programming experience
- Reliable availability (minimum 25 hours/week; maximum 40 hours/week)
- Reliable daily access to internet and PC

Interested students, send your resume & cover letter to LESA no later than **Friday 5/15**. Please include your preference in working for pay or for credit.

Send to:
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