California State University San Bernardino
School of Computer Science and Engineering

CSE 595 Undergraduate Independent Study

Date

March 18, 2020

Time

2:30pm-3:00pm

Location

JB359

Title

The Wireless Communication Research for TinyOS

Student

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Advisor

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Abstract

The purpose of this independent study is to study the fundamentals of wireless networks and sensing technologies. Learn the critical issues in wireless sensor networks (WSNs) such as source encoding, modulation, medium access control, routing, communication protocols, localization and tracking. Based on the fundamental knowledge, I will try to establish a sensor network and implement wireless programming and updating for the sensor nodes in the network. This will be done with a project based TinyOS and Deluge protocol. My subject matter will start with fundamental knowledge of wireless networking, sensing, and communications. To build up a wireless sensor network, I will get familiar with a typical WSN operation system TinyOS and typical wireless sensor mote: MEMSIC IRIS, MacaZ, MDA100, MTS300 in the process. TinyOS provides a number of interfaces to abstract the underlying communications services and a number of components that provide (implement) these interfaces. All of these interfaces and components use a common message buffer abstraction, called message_t, which is implemented as a nesC struct (similar to a C struct). The message_t abstraction replaces the TinyOS 1.x TOS_Msg abstraction. Unlike TinyOS 1.x, the members of message_t are opaque, and therefore not accessed directly. Rather, message_t is an abstract data type, whose members are read and written using accessor and mutator functions <ref name="fn1">TEP 111: message_t</ref>. This project is to form a small ad hoc sensor network by using three iris motes. The sender should have the node ID 1, the relay has the node ID 2, and the receiver has the node ID 3. Sender send data to the relay mote only, and the relay mote will send the data to the receiver.