EEE102 Term Project Proposal

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16 October 2022

Abstract

EEE 102 term project will be to implement Li-Fi protocol using Basys3 and via using this protocol demonstration of a text file transfer and sound file transfer.

Introduction and Description:

Li-Fi is a wireless communication technology that utilizes light to transmit data. This system is capable of transmitting data at high speeds over visible light, ultraviolet, and infrared spectrum. Also, as a technology, Li-Fi is able to function in areas without being affected by electromagnetic interference. Due to the extensive benefits of Li-Fi technology and the theories behind encoding and decoding certain file types. I wish to do the term project on this topic. The project will be implemented using the Basys3 board and LDR sensor to detect the signal, an LED to send the signals, and a buzzer to play the received sound file through it.

Design of the Project:

The project is planned to work on Basys3 and the decoder part will be implemented in a way that will decode the transmitted data and display the resulting outcome in a specific way, such as if the received data is a text file, then display it on the screen or if the data is sound file it will play it through the buzzer. When it comes to the encoder part, it is planned to be implemented on Basys3 if possible; otherwise, the encoded data will be transmitted through a serial port using a computer. For instance, the text file will be parsed into its characters, and the characters' ASCII code will be encoded into binary to transmit via LED. When LED is on, the LDR sensor will yield a higher output and it will be translated into 1 and contrarily, it will be low output 0 and the received data will be rendered by the decoder.

Components:

- Basys3 board
- Photoresistor (LDR sensor)
- Light emitting diode (LED)
- Buzzer

Demos:

Progress Demo:

In the progress demo, the project will have the ability to transmit the given text input data through the LED and receive it afterward as binary input. However, in this demo, rather than converting text files through Basys3, this process will be done externally and the encoded file will be transferred to Basys3 to be transmitted.

Final Demo:

In the final demo, the project will have the capability to transmit and receive text files and sound files with the use of LED and photoresistor. Additionally, these encoding and decoding operations will be done through the Basys3 board, and decoded sound files will be played using a buzzer to demonstrate that the Li-Fi transceiver works properly. Further, text files will be displayed with the assist of the screen.