AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
CREDIT HOURS PROGRAM

Fall Semester, 2023

CSE211: Introduction to Embedded Systems

Li-Fi Project

Li-Fi or **Light fidelity** is a wireless Communication Technology that uses the light to transmit data and information among different devices. Li-Fi can send the data at a very high speed, Theoretically up to 100 Gbit/sec, over the normal visible light, Infrared, or Ultraviolet spectrum.

- ***Li-Fi will attract many fields to use it for its advantages like:***

1. Light can't penetrate the walls. Therefore, No one can hack the signals from a remote place.
2. Transmission over the light will not interfere with the radar waves if exist and can be used safely in places with electromagnetic interference.

Project Description:

- You are required to build a small prototype (Sender + Receiver) that can be put in our homes for hazards detection. it works as below:

1- The sender platform (***TM4C123GH6PM***) is connected to three sensors (Fume Sensor, Ultrasonic Sensor, And Magnetic Sensor).

2- If sensors detect any danger (ex: fire, Door is opened, or intrusion). Data will be sent over

- **2.1** The light to the receiver platform, which can be any other board, to turn on alarms represented in a flashing Lamp, buzzer, and a **LCD** that **displays** a sentence related to the detected event (ex: "***Fire is reported"***).
- **2.2** Bluetooth to a mobile phone (***app inventor*** is an easy option) with the same sentence as the LCD.

Note: You need to make a simple solid structure to fix the light source.

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3- The system has 2 pushbuttons for the start/stop operations. it can be closed at any time.
4- If any alarm fires, the sounds continue until a mute pushbutton is pressed.
5- When the mute pushbutton is pressed, all alarms will be turned off after ***5 seconds***, but the system is still powered on.

Project Submission

Deliverables

Working on the project should be **in groups of five members** maximum. Each group will submit **a compressed file** containing the following deliverables:

1. Source code files. (Project folder) ***(65%)***
2. You should prepare a demo (at least 5 mins Video) for evaluation. ***(10%)***
3. A report in one PDF file containing: ***(25%)***
   - **a-** The contribution of each member of the group (What did each member do?).
   - **b-** System Layout.
   - **c-** List of components.
   - **d-** Circuits Wiring.
   - **e-** discussion of the developed Mobile App.
   - **f-** Flow charts or pseudo-codes of the main flow of the program.
   - **g-** Problems faced and how you managed to solve them.

Deadline: Week#12