Team 15 Practicum Project Ideas

Our team has decided to pursue **Idea 1** below for our practicum project.

Idea 1: 3D "Simon" Says Game

This project is a game that is similar to "Simon Says". The game works by displaying a sequence of lights and tones that correlate to specific buttons on the device. The game player than attempts to input the same sequence as the device displayed. The sequence starts at a length of 1 and increases by 1 with each successful matched sequence input by the player. When the player inputs an incorrect sequence the game ends and reports the length of the final correct sequence. This project will build on this concept by changing the typical plane of 4 buttons and expand it to a 3D shape such as a cube with 6 buttons or a octahedron with 8 sides. The device will use tactile buttons as sensors. The device will actuate a speaker and LEDs. This project can be implemented using an ATMega328P microcontroller.

Sensor: One button for every side of the object

Actuator: One LED for every button and a speaker for audible tones

Controller: ATMega328P

Idea 2: Cup With Temperature Indicator

This project's main purpose is to display the temperature of a cup and/or the liquid its holding so that the user can drink the liquid at its optimal/preferred temperature. The basic design of the project consists of a cup with a temperature sensor inside. The lower part of the cup would be where the microcontroller is stored. When the temperature of the inside of up shifts by a significant amount, the microcontroller would then save the temperature, and display it on a flexible LCD display on the outside of the cup for the user to read.

Sensor: Temperature Sensors

Actuator: LCD (16x2)

Controller: ATMega328P

Idea 3: Digital Clock

This project is aimed to design an automated system of digital clock and temperature thermometer, which assists people’s need on a daily basis to keep track of time. The problem with a regular digital clock is that we have to set the time manually every time the battery runs out or electric outages and also have to look elsewhere/other devices to know the exact time to set to. Therefore, this clock will come in advantage of helping us set the real time automatically with more accuracy. The basic concept of how this clock works is that it takes in measurements from LM335 and time information stored in DS1307, processes in ATMMega32 microcontroller and then displays these values via LCD 16x2 screen. The DS1307 is chosen because it has a built-in feature that can automatically switch to backup supply to keep track of time when power source outage, which assists our purpose of the project.

Sensor: DS1307/1038 serial real-time clock (RTC), LM335 Precision Temperature Sensors

Actuator: LCD (16x2)

Controller: ATMega328P