Design and Development of COVID Safety System for Classroom Entrance

The purpose of this project is to minimize the spread of COVID or similar transmittable diseases by with the use of advanced technology. In this project we are focusing on checking the presence of face mask, measuring the human body temperature without physical contact, dispensing the sanitizer automatically, counting and restricting the people entry into the building and automatic gate control.

We make use of a laser diode and receiver to detect the entrance of a person, when the person is detected at the entrance it will check the face mask using Image Processing and then checks the temperature of the person. If the temperature is less than the predefined temperature the person is allowed entry otherwise the entry is denied. Only a pre-determined number of people are allowed in the room. The allowed number of people actively present in the room can be set/viewed using a Push buttons and LCD. After temperature of the person is checked then it dispenses the Sanitizer automatically. After this the gate opens so that the person enters into to college or building premises.

COVID 19 has made a huge impact on the society, the new restriction has been imposed as in the number of users allowed in a particular room in colleges, offices, shops, etc. to maintain social distancing, along with social distancing regular temperature check at entrances of malls, the office is mandatory.

   For human presence sensing at entry and exit points we are using laser and LDR based sensing system. All these sensors and actuators are interfaces to Arduino UNO microcontroller board.  Arduino microcontroller is programmed with embedded C program to make it work as per our requirements. ESP32 CAM is used to recognize the face mask and returns that information to Arduino Uno. We are using Google’s Teachable Machines algorithms with ESP32.

**The main blocks of this project are**:

* Micro controller (Arduino Uno)
* ESP32 CAM to detect face mask.
* Reset button
* Crystal oscillator
* Onboard Regulated power supply (RPS)
* Laser LED lights.
* LDR Sensors.
* LCD display.
* Buzzer.
* Servo Motor for gate operations.
* DC Water Pump for Sanitizer spray
* MOSFET Driver to run the DC Pump.

Block Diagram:

