

Sample Project Ideas

1. IoT based Smart Dustbin

Team Members:

Project Idea:

With increase in population, we have an increase in the garbage around urban areas. Usual dustbins require to be opened by pressing foot against its lever and then throwing garbage. Also, there is huge probability for the bin to overflow as it becomes difficult to keep a track on the level of the bin all the time. Hence, a smart dustbin that operates automatically to help solve this issue using IOT and sensor-based circuitry is becoming need of the hour.

The proposed system consists of two sensors, namely ultrasonic sensor and motion detection sensor. The ultrasonic sensor constantly measures the level of garbage in the bin and automatically detects if it is about to fill up. The motion detection sensor is used to detect the presence of people around. The dustbin opens automatically when it receives the signal and closes its hatch. The mechanical moment of the bin's hatch can be controlled with the help of a servo motor. Parallely, the bin level reading will be posted to oneM2M. A buzzer is used to alarm whenever the bin is filled.

Required components:

1. ESP32 module
2. Ultrasonic sensor
3. PIR motion sensor
4. Servo motor
5. Buzzer
6. Breadboard
7. Jumpers

2. Tracking Pet Movement

Team Members:

Project Idea:

Tracking Pet movement for people who have pets at their homes, sometimes it becomes difficult to keep track of what your pet is doing. Pets can be dogs, cats or domesticated animals like cows and buffaloes. Usually, pets keep moving around the house and sometimes we need to check their presence.

The proposed model is to make use of a motion sensor, and this is to be installed at the entrance of your house or wherever you want to keep track of your pet's movement. There should be a buzzer alarm to indicate activity of your and this information needs to be sent to your mobile phone through ESP32. You can make use of the Blynk app or just make a website that keeps a log of the activities. The sensor data is posted to the cloud at certain frequency.

Required components:

1. ESP32 module
2. Ultrasonic sensor
3. PIR motion sensor
4. Buzzer

3. Kitchen Humidity, Pressure, and Temperature Tracker

Team Members:

Project Idea:

Indoor air quality and heat exposure have become an important occupational health and safety concern in several workplaces including kitchens of hotels. This study investigated the heat, particulate matter (PM), total volatile organic compounds (TVOCs) and polycyclic aromatic hydrocarbons (PAHs) emissions in indoor air of commercial kitchen and its association with kidney dysfunctions among kitchen workers.

The proposed model is to make use of temperature and humidity sensor along with a pressure sensor and this is to be installed in the kitchen of your house (or bedroom or bathroom). There should be a buzzer alarm to indicate extraordinary measurements and this information needs to be sent to your mobile phone through ESP32 along with a buzzer to be triggered. You can make use of the Blynk app or just make a website that keeps a log of the activities. The corresponding sensor values will be posted to the server.

Required components:

1. ESP32 module
2. DHT11 module
3. BMP180 Digital Barometric Pressure Sensor
4. Buzzer

Reference: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4752274>

4. Water Level measurement in Overhead Tanks

Team Members:

Project Idea:

With the alarming levels of global warming, drinking water is now more precious than ever. In such a global crisis every drop counts. Overflowing of overhead Tanks is a quite common phenomenon in urban areas.

The proposed model is to make use of the water level sensor along with any other given sensor to keep track of the water level in the overhead tank. There should be a buzzer alarm to indicate a full tank or low level of water in the tank. Your application should serve as a useful device for the end user. The details such as time taken to fill the tank, or any useful information should be sent to the end user by either email alert or a simple mobile notification using the Blynk app. The water level data will be continuously posted to the cloud at regular intervals.

Required components:

1. ESP32 module
2. Water Level Sensor
3. LED's
4. Buzzer

5. Controlling the Volume of a speaker

Team Members:

Project Idea:

Speakers have been used for many years to convert electrical signals into audio sound waves. We use speakers very much in our daily life for parties, events, even in households. Our idea is to control the volume of the speaker to make it easier for using the speaker.

This system uses a PIR motion sensor which allows it to detect motion. We use this sensor to detect the hand motion and control the volume of the speaker based on that. We upload the speaker volumes to the things peak which allows for making analysis of the speaker volume we are using. And also, when the speaker volume is too high which is harmful to our ears or when it has been high for a long time, a buzzer is used to give alarm.

Required components:

1. ESP32 module
2. PIR motion sensor
3. Jumper wires
4. Buzzer

6. IoT Diwali sweet dispenser

Team Members:

Project Idea:

Sweets can be considered as the best part of Diwali. As covid cases might be quite high during that time, social distance will be a must. An IoT sweet dispenser, which is basically a sweet box with sensors fitted in, can be placed outside the door. People who live in flats can use this, as when someone crosses through their door, sweet dispenser will be activated.

- A motion sensor can be used to detect people outside the door that will activate the servo motor, that will lift the top of sweet box up. People then can take the sweets out.
- To have the idea of no. of sweets that are still left in box, by making 2 holes in box, we can fit an ultrasonic sensor.
- By calibrating the ultrasonic sensor with box size, we can activate a buzzer or led, if the sweet box needs a refill.

Required components:

1. ESP32 module
2. Ultrasonic sensor
3. LED's
4. Buzzer

7. Smart Cadence meter

Team Members:

Project Idea:

The coronavirus pandemic has caused a huge resurgence in the popularity of cycling. One of the most important things that novices must focus on is improving their “cadence” or the speed at which they pedal (measured in terms of the revolutions per minute of the crank and pedals) since studies have shown that a high cadence of about 120 is the most efficient way to cycle.

A cadence meter would perform the same job as the tachometer in a car and help us change gears correctly. Storing the cadence data for the entire trip would enable us to perform analysis like correlating it with elevation and wind speed and show us where to improve. However commercial cadence meters are very expensive and not economical for the average user.

Design a system to measure a cyclist’s cadence and show it live on a mobile device. The data also needs to be stored on the host device or the cloud for later analysis. Use green and red LEDs to show whether current cadence is above or below a user set value. Get additional data from apps like Strava and perform analysis and show it on an online dashboard.

The ESP32 Devkit 1 contains an inbuilt hall effect sensor. By mounting a magnet on one of the pedals, you can use the change in strength of the magnetic field w.r.t time to calculate the rpm of the crank. This data can be either be sent through Bluetooth to a phone which can show the display live and upload it to the cloud which the mobile can retrieve and display

Required components:

1. ESP32 module
2. Magnet
3. LED's
4. Jumper wires