Embedded Microcontroller Projects Ideas

A) Home Automation System.

   i)   Secured Room Access System.

   ii)   GSM Based Home Automation.

   iii)   Fingerprint based security system.

   iv)   Bluetooth based home automation.

1) **Density Based Traffic Signal System using Microcontroller.**

2) **Ultrasonic Radar Model Using Microcontroller ATmega128.**

3) **ATmega16A Based GPS Receiver.**

4) **Automatic Drip Irrigation System.**

   Conventional irrigation method wastes a lot of water, leading to a high cost of electricity to run the pump set for irrigation. Automation can help save water, electricity as well as human efforts. This can be achieved with the help of a single soil-moisture sensor and an AVR microcontroller. Here we present an automatic drip irrigation system that senses the moisture level of the soil and automatically switches the pump on when the power is 'on.'

5) **Cellphone-Based Device Control with Voice Acknowledgement.**

6) **Fire Extinguishing Robot.**

7) **Haptic technology based Pick & Place robot using accelerometer.**

8) **AVR Microcontroller based Temperature Monitoring and Control System.**

9) **Black box for car project.**

   Black box for bike/car project is used for vehicle tracking and accident monitoring. This project uses 128x64 Graphical LCD, GSM module, GPS module to track the vehicle and displays real time data on LCD also keeps log of the data. It is having VB6 Software to display log data.

B) Robotics Project

   i) Human detection robot.

10) **Real time Patient monitoring system using gsm module.**

11) **SMS Based Voting System – AVR GSM Project**

12) **Intelligent temperature monitoring and control system using avr microcontroller.**

13) **GSM Based Fire Alarm System.**

14) RFID based security system using AVR ATmega32 microcontroller.

ARDUINO PROJECT LIST

1) **Smart Stick Using Arduino Uno: Aiding the Visually Impaired.**

   Obstacle detection is one of the major concerns for a fully or a partially blind person (e.g. person suffering from night-blindness, cataracts, glaucoma, albinism or injury). Presented here is a smart stick using Arduino Uno. The stick uses Ultrasonic sensors for obstacle detection. The main aim of this project is to detect nearby obstacle and notify the user of the direction of that obstacle, thereby enabling the user to determine the corrective direction to head.

2) **Arduino Based GSM Home Security System.**

   This project is designed using normally-closed reed switches connected to doors and windows and additional passive infrared (PIR) motion sensors to detect movement of a burglar or an unwanted intruder in your home. The security system can dial up to two phone numbers to alert you. It can also send text message to one of the numbers.

3) **Humidity And Temperature monitoring Using Arduino With The IoT**

   Using the Internet of Things (IoT) in homes and industries it is possible to control any electrical or electronic equipment. Moreover, you can get the information from any sensor and analyse it graphically or in any user-defined format from anywhere in the world. The IoT using Arduino microcontroller (MCU) is easy and fun for those who are new to the field. Presented here is a humidity and temperature monitoring using Arduino.

   In this article, humidity and temperature information from DHT-11 sensor is analysed graphically on Thing Speak platform using Arduino MCU and ESP8266 Wi-Fi module. Block diagram of the whole setup is shown in Fig. 1.
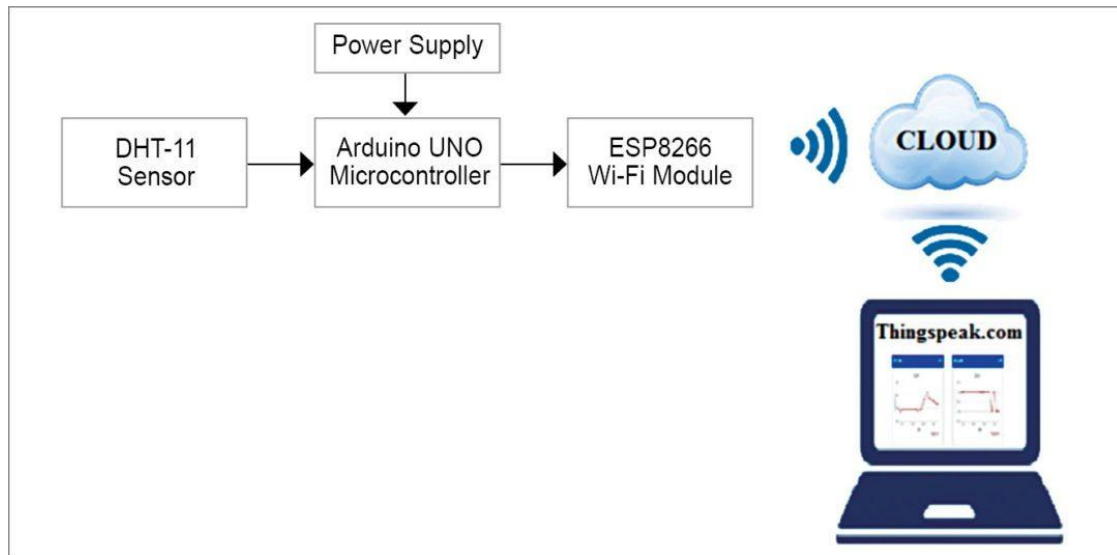
4) **Fingerprint Door Unlock System**

This simple fingerprint door unlock project using Arduino can be very useful for door security, forensics, crime investigation, personal identification, attendance system and much more. In the future, there could be many more applications like fingerprint based driving licenses, bank accounts operation and so on.

The whole system works under a simple algorithm called matching algorithm, which is used to compare previously-stored templates of fingerprints against users' fingerprints for authentication purposes.

5) **Home Automation System Using a Simple Android App**

6) **Human Detector Projects**

7) **Wireless Gesture Controlled Robot**

8) **Fridge Temperature and Humidity Indicator**

9) **Arduino: Digital Soil Moisture Meter.**

10) **Arduino: Vehicle anti-theft system using GSM modem and vibration sensor.**

The aim of this project is to demonstrate use of Vibration sensor to detect vehicle theft and also GSM module applications. This project has GSM technology and Vehicle anti-theft system with vehicle ignition controlling technique. Whenever car owner removes key from the ignition lock at that system is turned on. We have provided vibration sensor with this project, which is similar to piezoelectric sensor. When vibrations are detected, SMS is sent to the owner of the car. When car owner sends back sms to project then the engine is stopped. We can provide a Relay to turn odd engine.

11) **IoT-Enabled Air Pollution Meter with Digital Dashboard on Smartphone.**

Presented here is a IoT enabled air pollution meter to monitor air quality on your smartphone using Blynk application and Arduino board. Blynk is an Internet of Things (IoT) platform to control Arduino, Raspberry Pi and the like over the Internet. In this project Blynk provides a

digital dashboard on your smartphone that displays real-time air quality readings for the immediate surroundings.

IEEE Base Projects (2017)

1) A Real Time Street Lighting Control System.

2) Economic Feasibility of Solar Powered Street Lighting System.

3) Anti-theft Protection of Vehicle by GSM with Fingerprint Verification.

4) Design and Implementation of a Fingerprint Based Lock System for Shared Access.

5) A Real-Time Flood Alert System for Parking Lots.

6) Design and Implementation of a System Access Control by RFID.