Description

For the project we are using an ESP 32 to control the lock of a door. It also generates the otp that will be sent to the user via telegram bot. The user interface is accessed by a local website where the user will have to log in and also verify the otp. The whole system revolves around firebase to manage data and authentication.

Device features

1. Ultrasonic sensor - To unlock the door from the inside
2. Telegram bot - Sending photos from unsuccessful logins and sending OTP generated from microcontroller. Also able to use slash commands to remotely control the camera
3. Website - Provides an interface for users to login and generate otp to unlock the door

Hardware needed

1. ESP 32
2. ESP 32 Camera
3. Servo motor
4. Ultrasonic sensor

Usage flow

1. Door will be in locked position
2. A user will have 5 tries to log in on a website and request for OTP
3. After 5 unsuccessful attempts, the login button is disabled and a photo will be taken and sent to the owner via telegram
4. OTP is generated by the ESP 32 and sent to the user over a telegram bot
5. The user has 5 tries to key in the OTP on the website
6. After 5 tries the OTP resets and a photo will be taken and sent to the owner via telegram
7. Upon successful OTP submission the the ESP32 will read that the login was successful and unlock the door for 15 seconds
8. The ESP 32 will wait for a request for OTP again
9. The ultrasonic sensor is used to unlock the door from inside the house by waving an object less than 5 cm away.
10. Upon detecting an object it will unlock the door for 15 seconds

How to set up the system

Software/database needed

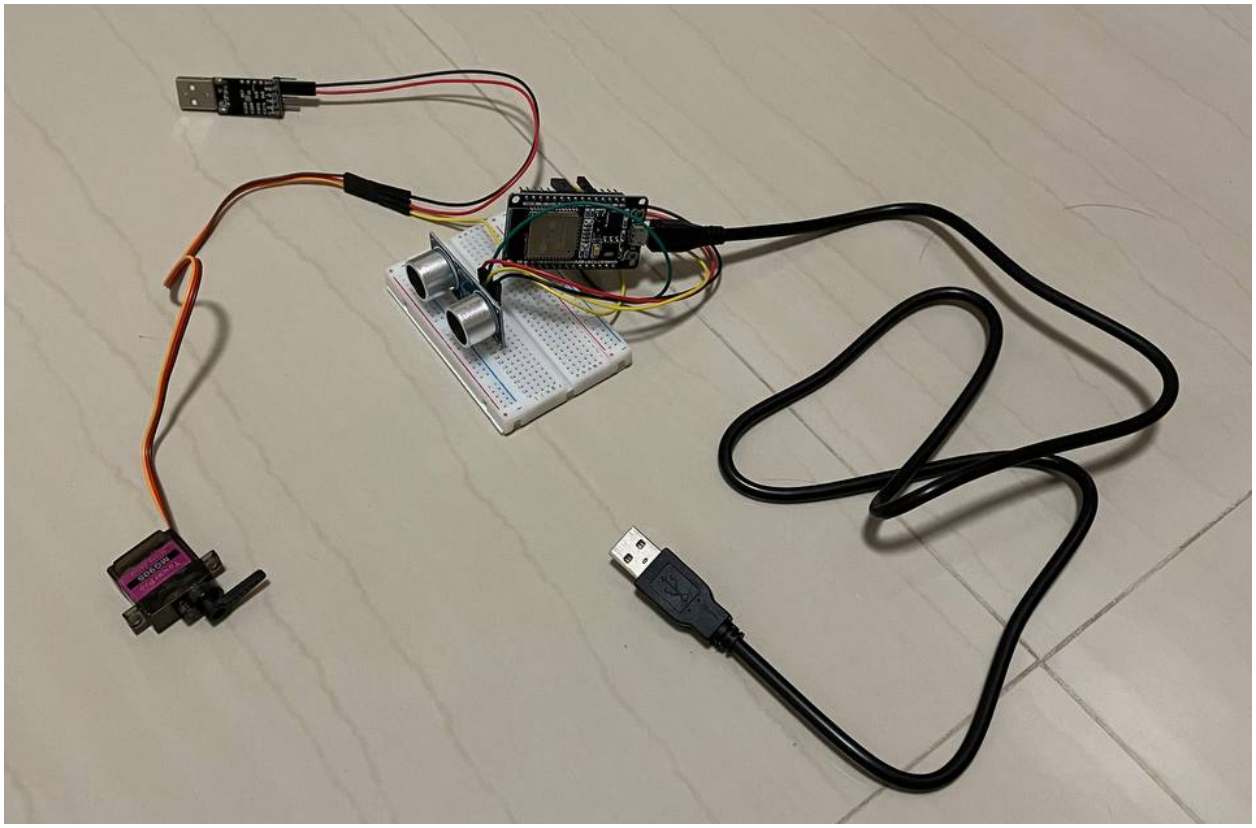
1. Arduino
2. Visual studio code
3. Telegram
4. Firebase console

Set up requirements

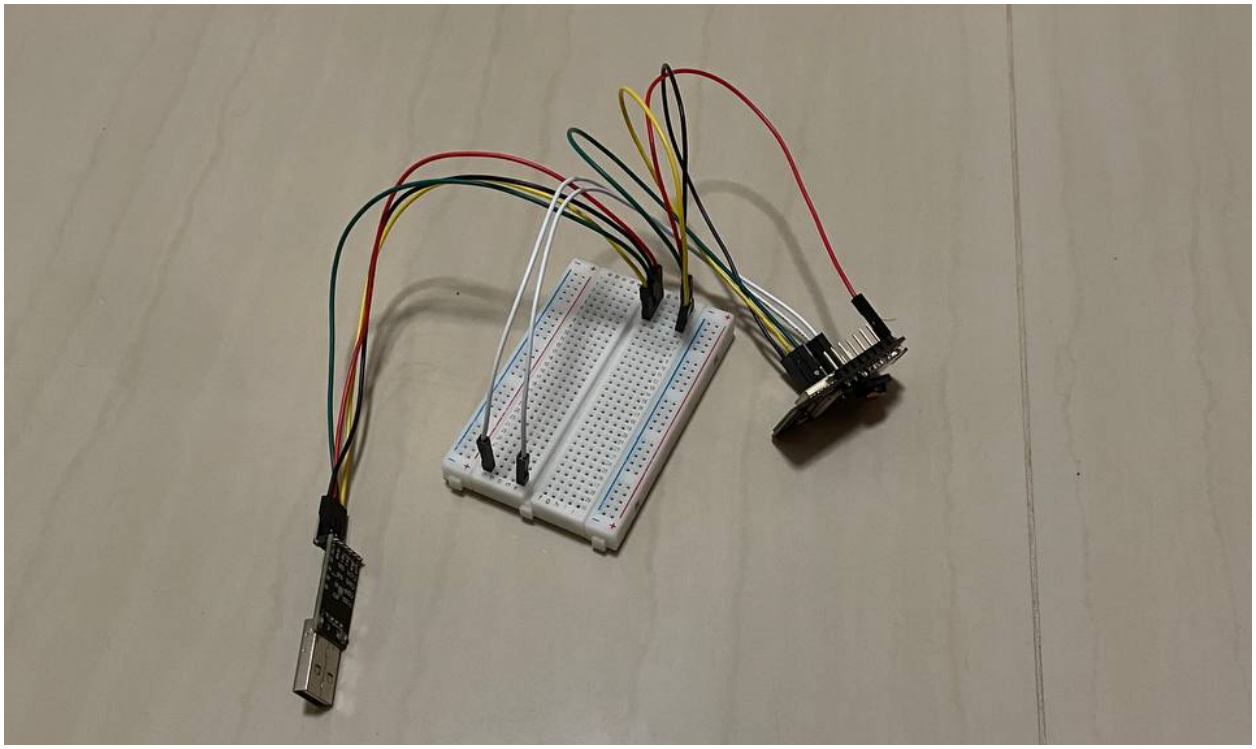
1. The user has to set up a real time database with Firebase and register users for authentication
2. Take note of the following (API write key, database URL, authentication domain, project id, storage bucket, messagingSendID, appId, measurementId) these will be needed for the website code
3. Paste the following into the html code in the website as firebaseConfig
4. In the arduino codes enter your own WiFi username and password, Firebase api key, database url and authorised user credentials
5. Create your own telegram bot using bot father and add it to a chat
6. Obtain the chat ID and input it into the arduino codes
7. Set up done

```
const firebaseConfig = {
    apiKey: "AIzaSyDvSSiL_4vqiZdBlvi1VhEcmObE9pxf19A",
    authDomain: "iots-door-to-door.firebaseapp.com",
    databaseURL: "https://iots-door-to-door-default-rtdb.asia-southeast1.firebasedatabase.app",
    projectId: "iots-door-to-door",
    storageBucket: "iots-door-to-door.appspot.com",
    messagingSenderId: "944195630637",
    appId: "1:944195630637:web:b708a357968d4e596baaa4",
    measurementId: "G-08BYTRGKP6",
};
```

Example of firebase config



Connection of ESP32 with motor and ultrasonic sensor



Connection of esp32 cam

Circuit diagrams