



Hardware Graduation Project

BROADCASTING HOUSE

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Outline

Topics

Introduction

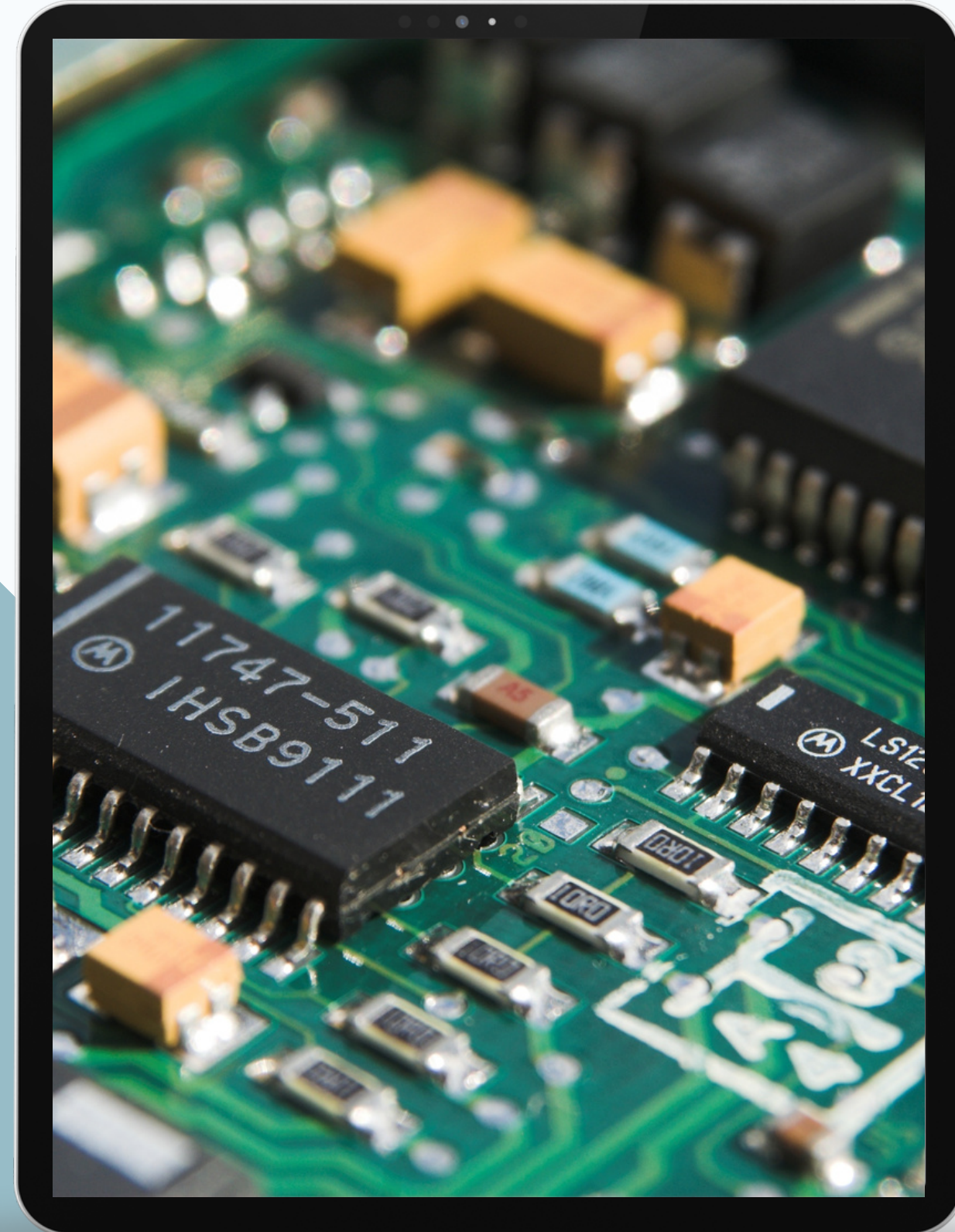
Overview

Features

Tools

Constraints

Demo



INTRODUCTION

Nowadays, there is an importance of hardware technologies, and IoT in our life. They have wide usage, for example, we can use them to protect our houses against threats, such as intruders and strangers, natural disasters, burnings, water leak, and so on. But in our project today, we will talk about threats caused by thieves.



OVERVIEW

The project represents a security system, which aims to reduce the stealing probability caused by thieves through catching them by sensors, and notifying the house owner and the security guards.

Features

Project features focus on catch thief at three cases

THIEF MODE

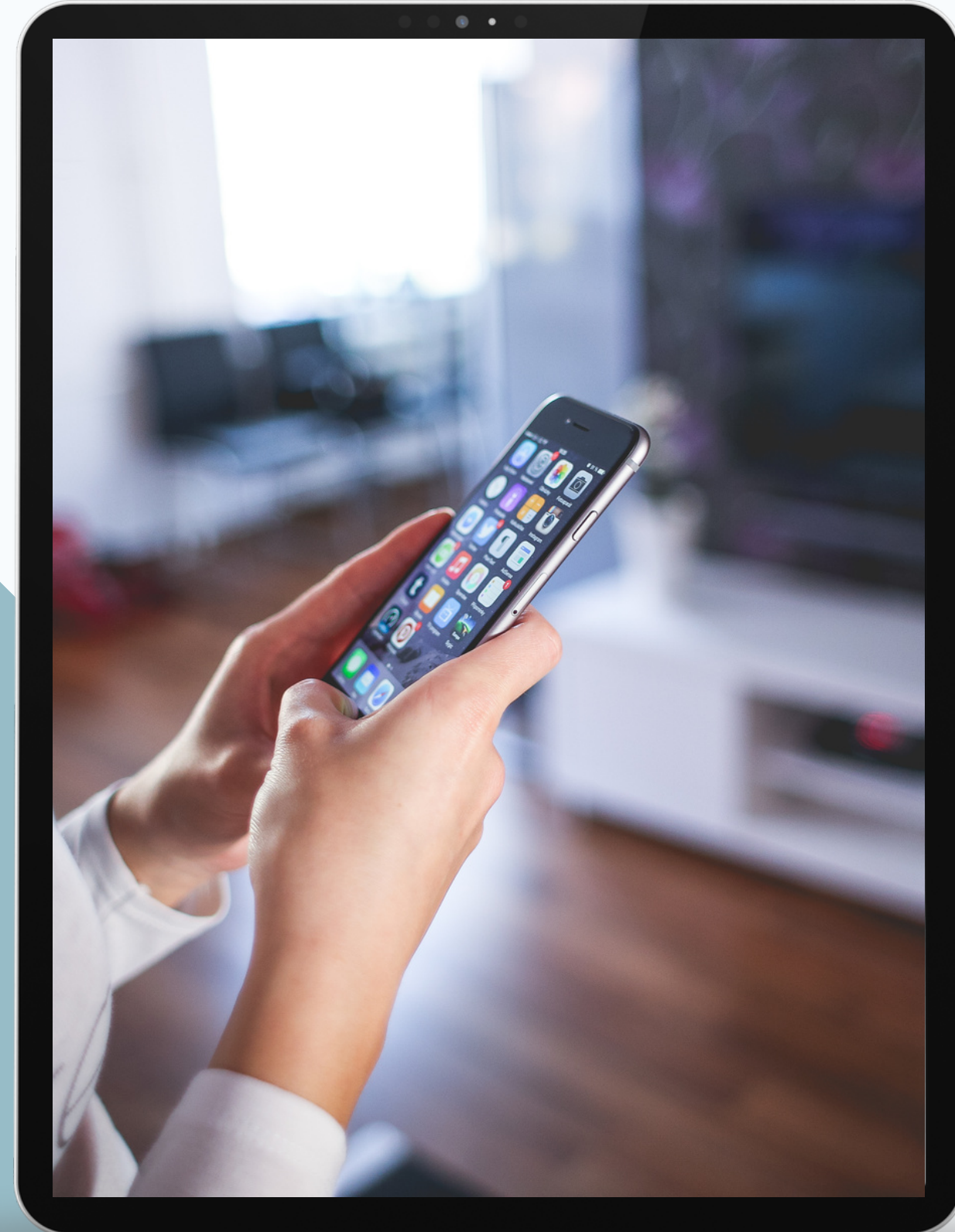
The sensors will catch thieves if they jumped through house ceilings into house.

SECURE MODE

Any person has to authenticate himself through his fingerprint, then through enter password on the keypad.

RE-THIEF

If the house owner will leave his home, he will enter an inner password to enable security system.



Features

Mobile Application Notifications

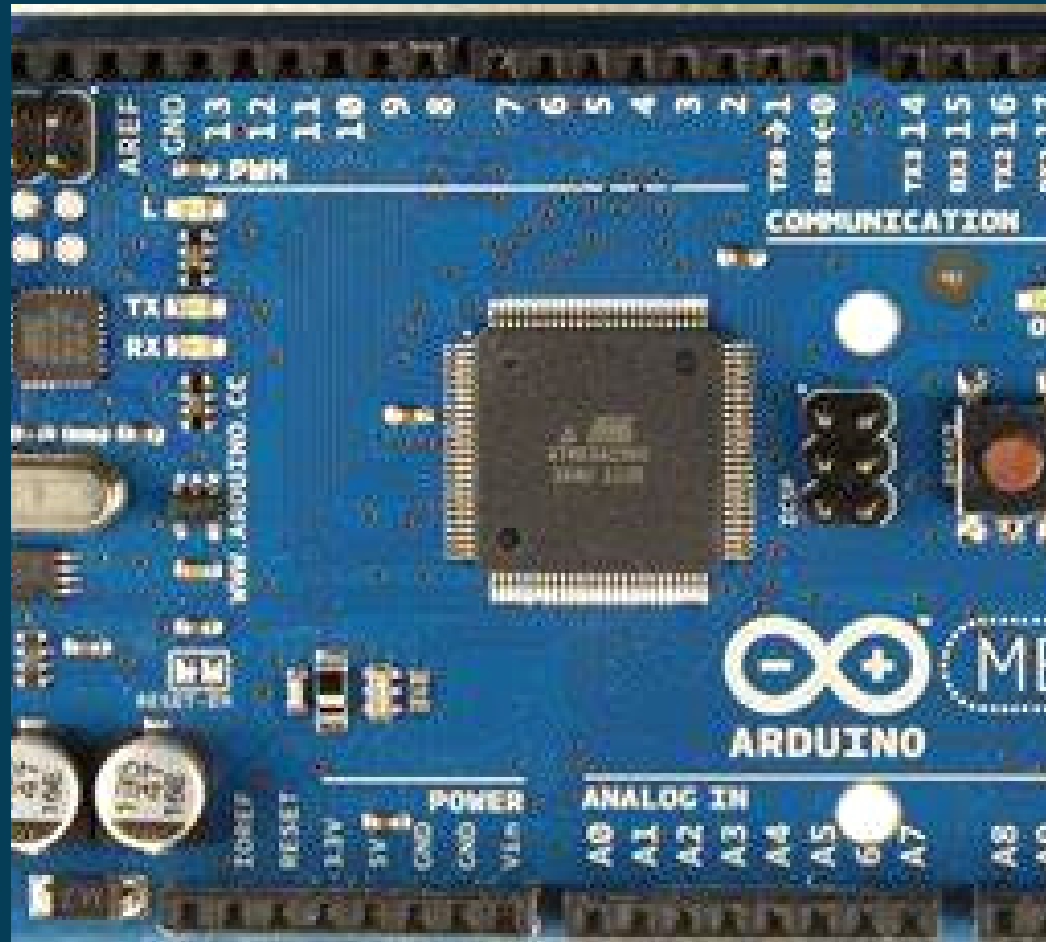
If a thief detected, a notification will send from the system to the mobile application of the house owner in order to tell them that there is a thief in his house



Features

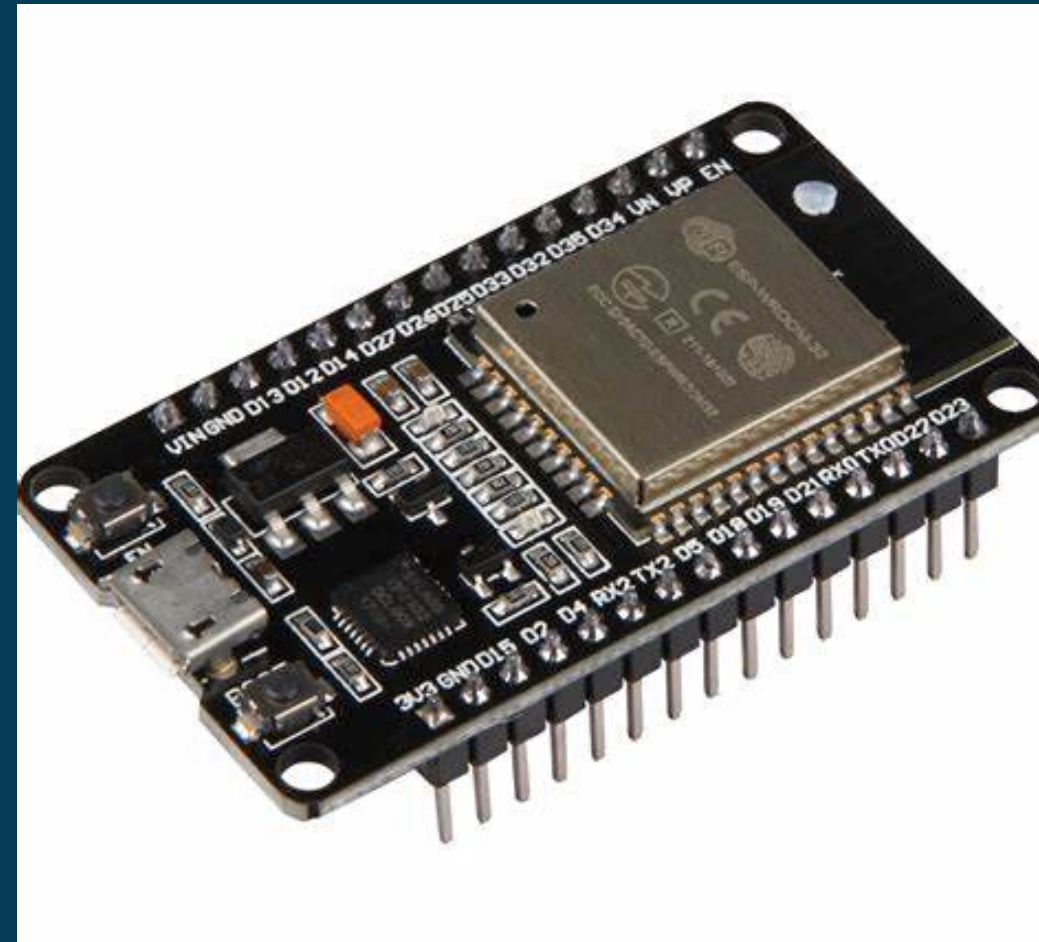
Live Streaming

Our system will show the house owner thief motion , and the camera will follow where the thief is move.



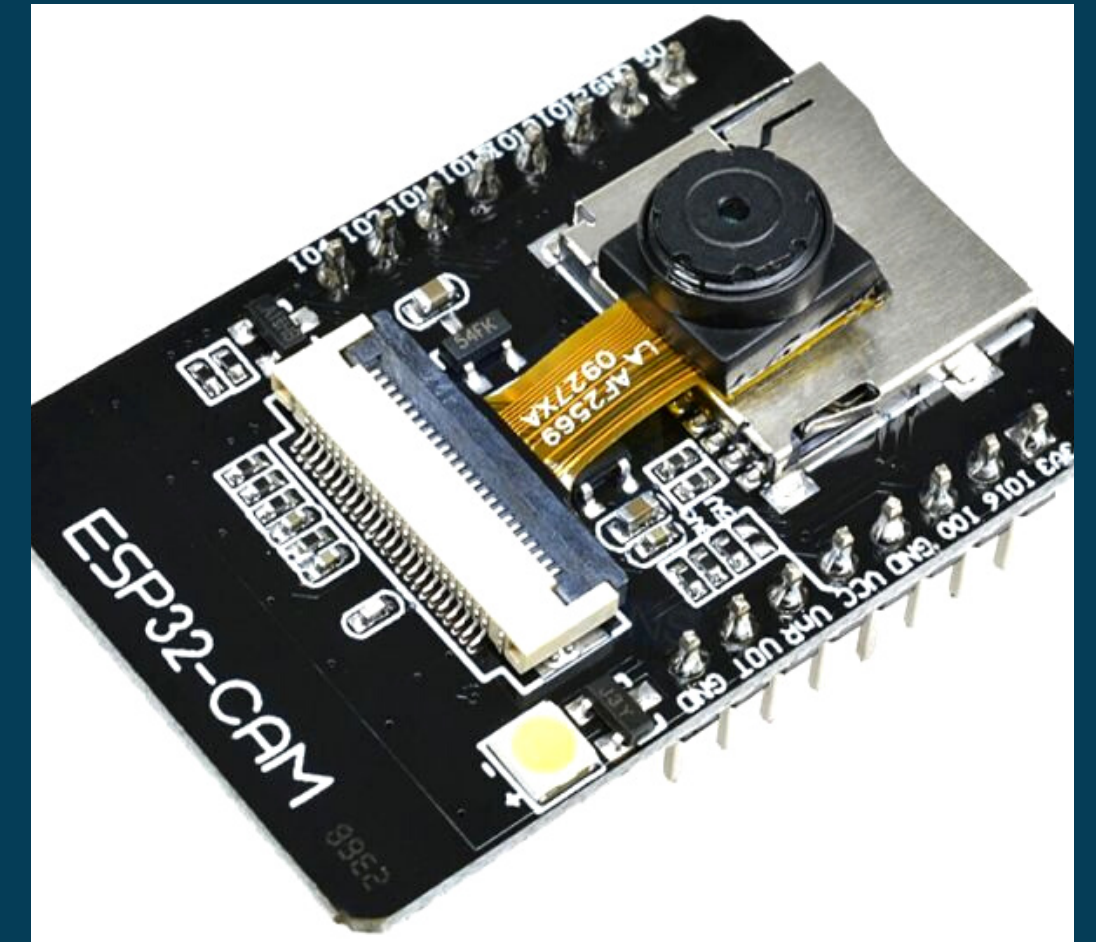
ARDUINO MEGA

ATMega2560



ESP32 WROOM

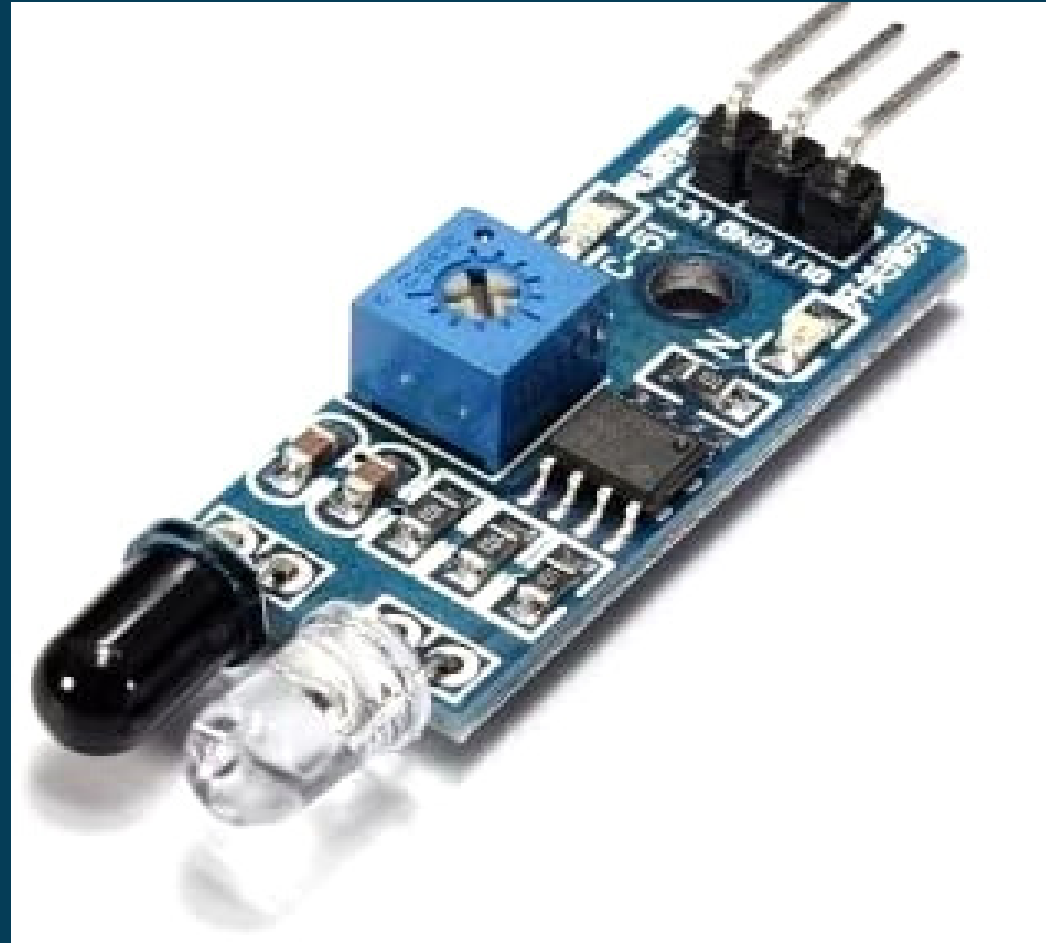
Microcontroller with Wi-Fi & Bluetooth modules.



ESP32 CAMERA

AI THINKER

Components



IR SENSOR

Flying-Fish



FINGERPRINT SENSOR

Jm-101B



KEYPAD

4X4 Keypad

Components



SERVO MOTOR

MG996R



LITHIUM BATTERIES

x2 4.7A 3.7V | x2 1.5A 3.7V



BUZZER

Components

Visualization

We made a concerted effort to create a project visualization that closely aligns with real-world conceptual ideas. Constraints related to physical installation, scalability, and compatibility with any other house existing infrastructure may need to be taken into account.

Constraints



PIR Sensor

When we started our work in the project, we chose the PIR sensor for motion detection, but unfortunately, it has high sensitivity to detect objects started from 3m and up to 10m, so we decided to replace it by IR sensor.

Constraints

IR Sensor High Sensitivity

The IR sensor has high sensitivity to detect objects related to the brightness, so if the room brightness is high, we have to reduce the IR sensitivity.



Constraints

ESP32CAM - Current (I)

Servo motor stalling state would consume 2.5A while 500mA in running state. That would affect the camera and disconnect the wifi connection.



Constraints

EXPANSION IN IOT DEVICES

Further expand the system's compatibility with a wider range of IoT devices and sensors

ADVANCED DETECTION TECHNOLOGIES

Explore ways to integrate the image processing-based thief detection system

ACCESS CONTROL

Provide home owners and security guards with more access control, on doors, lights, locks and etc.

Future Work



THANKS FOR LISTENING!