

# **GROUP 04**

# **SMART INTRUDER ALERT SYSTEM**

LET US PROTECT YOUR PLACE

# OUR TEAM

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# INTRODUCTION



Security is crucial today to safeguard our possessions from theft in both residential and commercial areas



To identify the intruders in the home premises, we need an alert system



It is challenging to differentiate human and animal movement through existing alert systems.

# OBJECTIVES

**Our main objective is to create a smart intruder system. Its goal is to detect if any human intruders enters into the home premises.**

**This system helps to :**

- Protect possessions.

Ensure the security of the home even the residents are not at home.

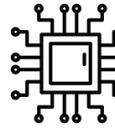
- Provide convenience and comfort

A monitored security system allows us to do our work without any interruptions.



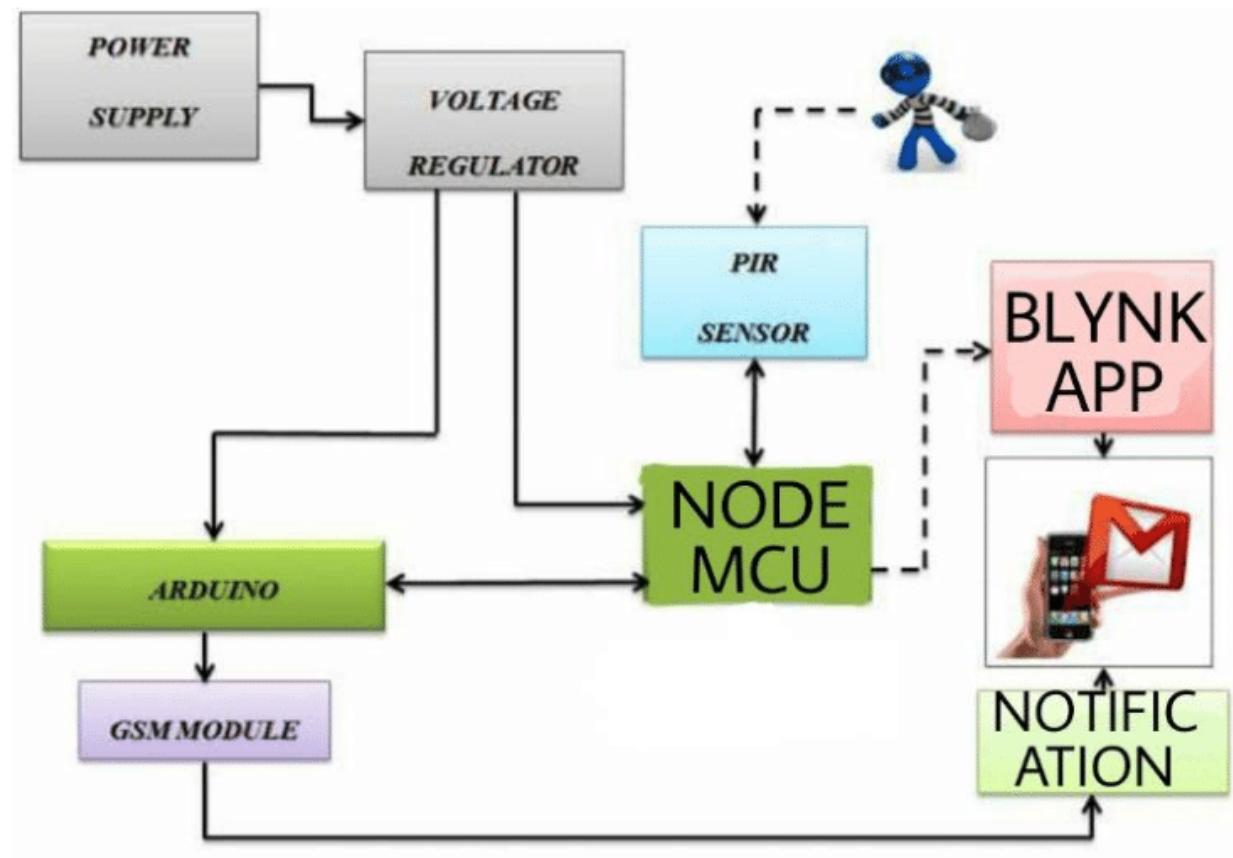
# BENEFITS



-  **The system will notify the information about the intruder**
-  **Circuitry is not that much complicated**
-  **Easy installation**
-  **Less management after installation**
-  **Even if the owner is away from home, with the alert message owner can be able to take action.**

# EXISTING SYSTEMS

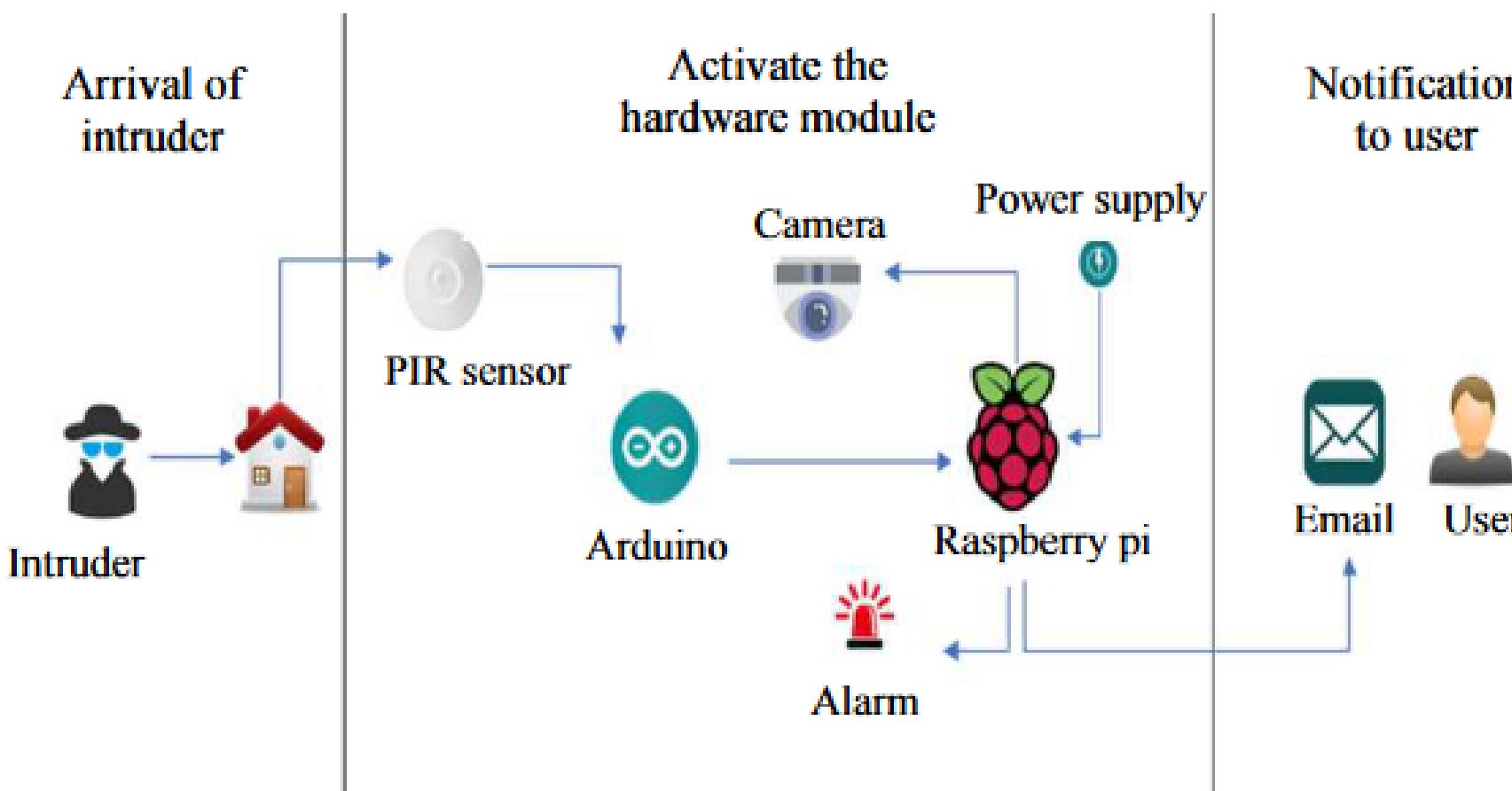
## IoT Based Smart Intruder Detection System For Smart Homes



- This system uses a Blynk app to convey notification about the intruder.
- But the system doesn't send any images about the intruder.

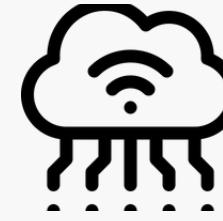
# EXISTING SYSTEMS

## An IoT-based House Intruder Detection and Alert System using Histogram of Oriented Gradients



- This system performed object recognition using a Histogram of Oriented Gradients.
- This is a little much complicated and expensive.
- There are much more technology than using histograms in image processing

# SUPPORTING TECHNOLOGIES



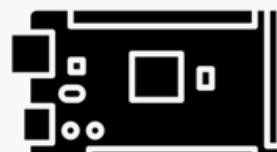
## IoT Technology

The Internet of things (IoT) describes physical objects with sensors, processing ability, software and other technologies that connect and exchange data.



## PIR Sensor

Passive infrared sensor (PIR) is an electronic sensor used in motion detectors such as automatically triggered protection systems.



## Arduino Mega

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs via sensors.



## ESP32 Camera

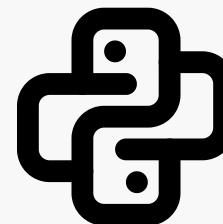
The ESP32-CAM is a small-size, low-power consumption camera module based on ESP32.

# SUPPORTING TECHNOLOGIES



## Firebase

The Firebase Realtime Database is cloud-hosted. Data is stored as JSON and synchronized in real time to every connected client.



## Python

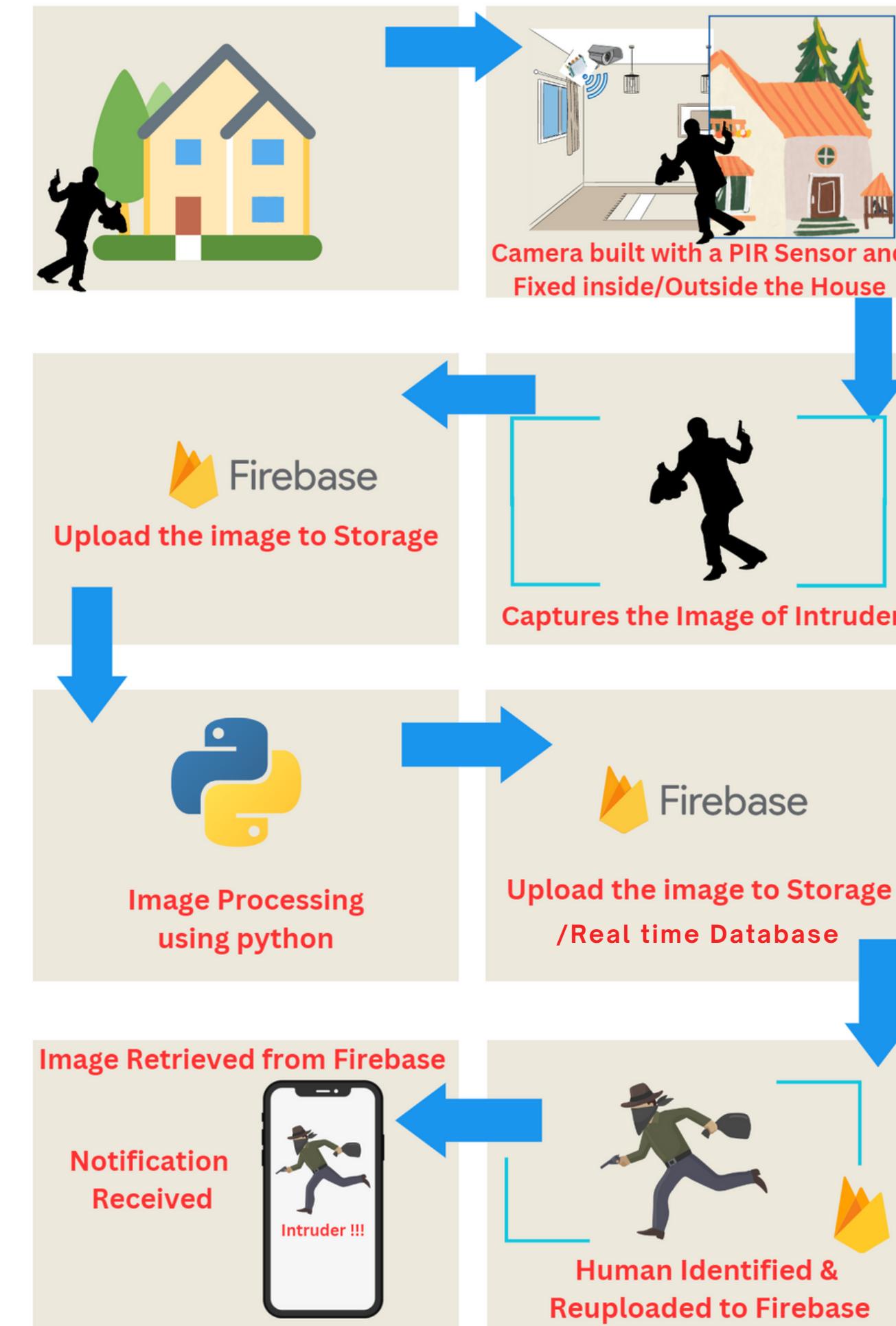
Python is a programming language for image processing due to its extensive library ecosystem, particularly the availability of libraries like OpenCV and PIL.



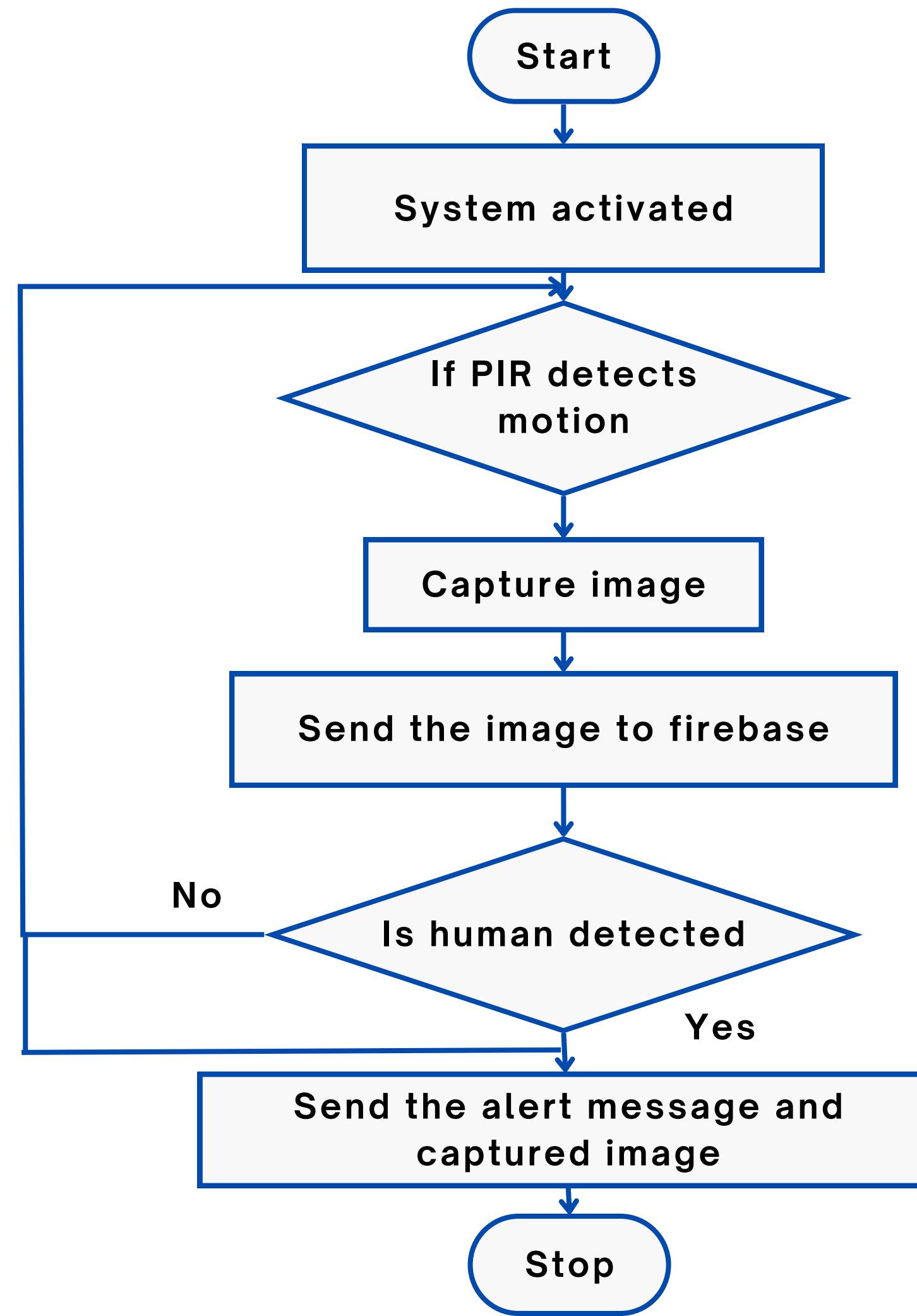
## Flutter

Flutter is an open source framework by Google for building beautiful, natively compiled, multi-platform applications from a single codebase.

# Methodology



# Flowchart



# IMPLEMENTATION

## Person Identified



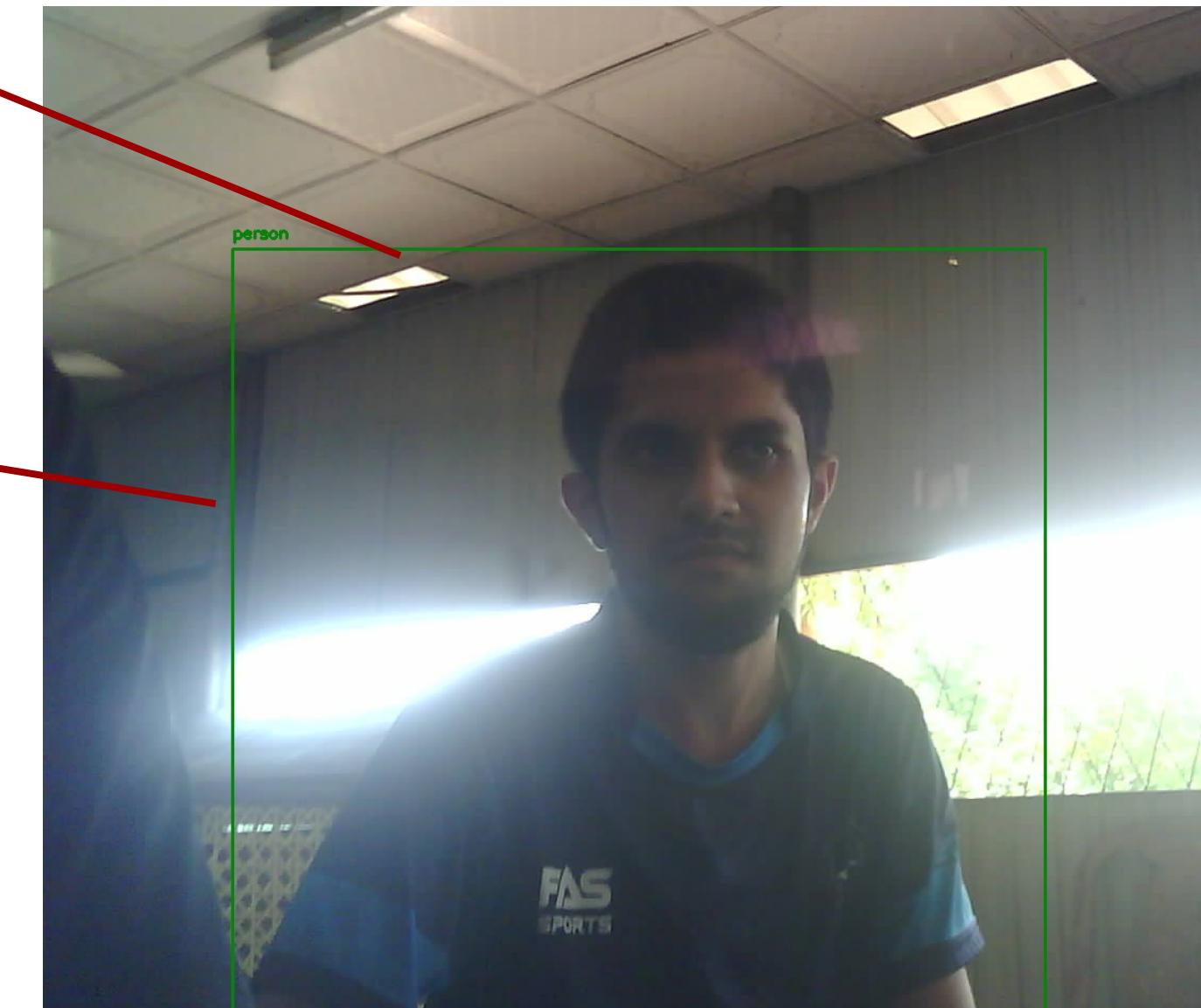
Captured Image



Confidence  
Score = 0.1



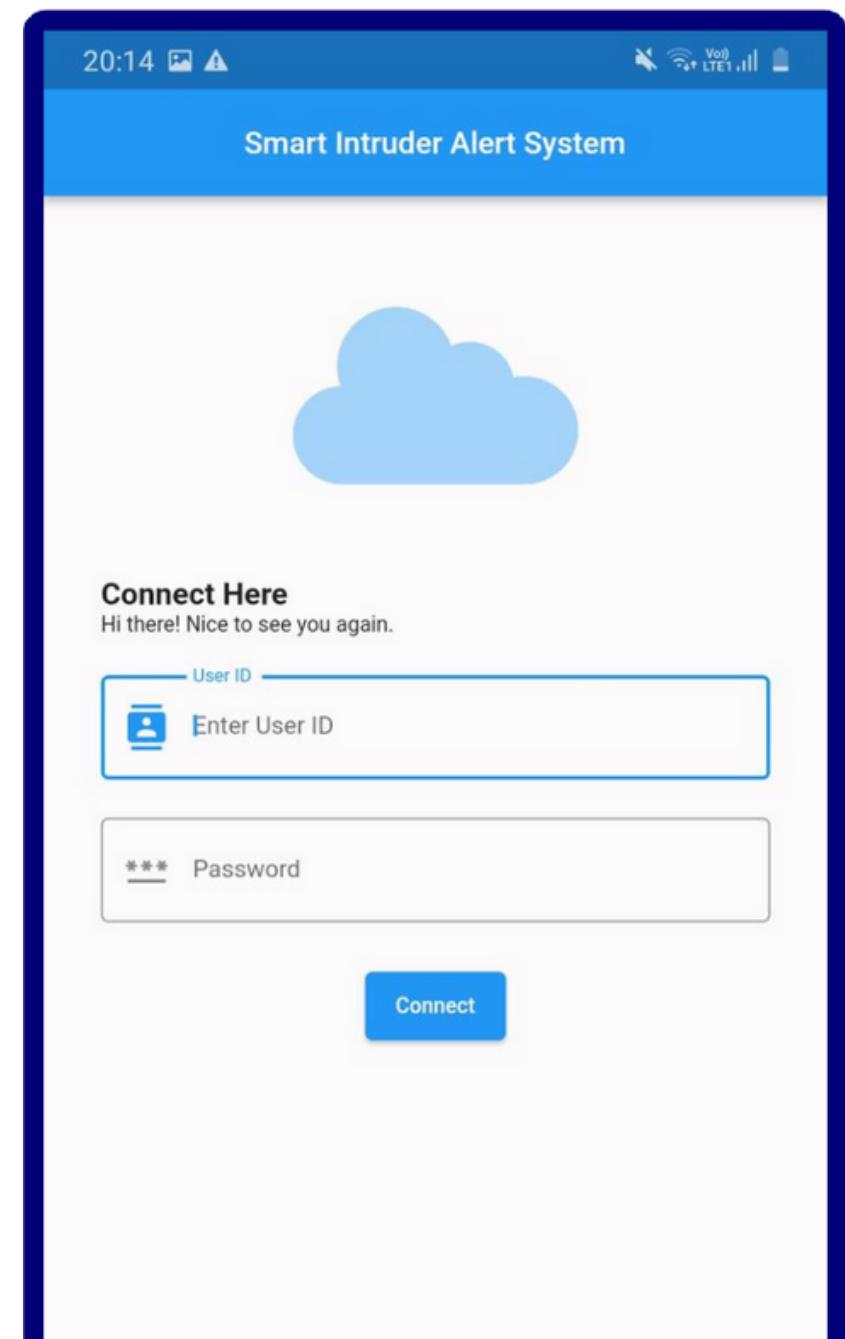
Common object Detection



Identified image

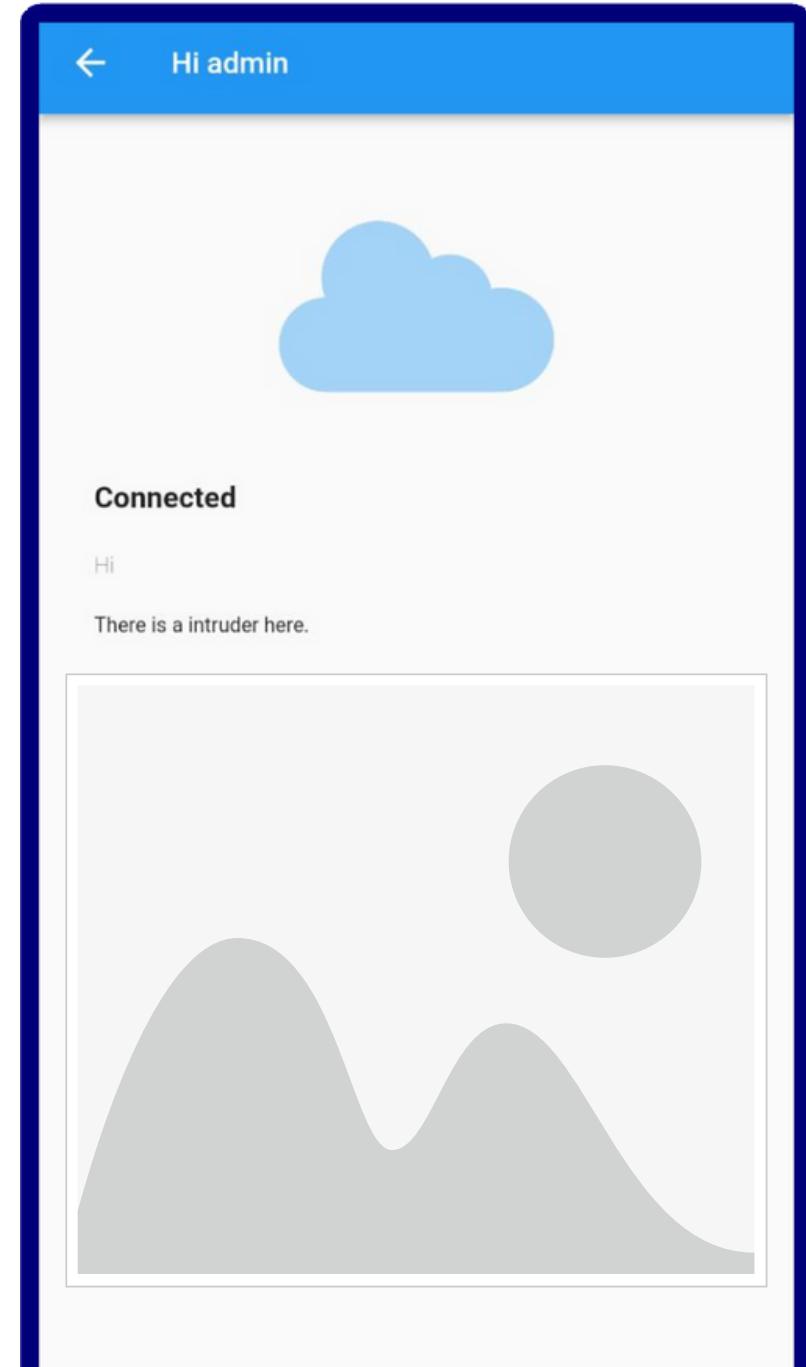
# IMPLEMENTATION

## Mobile Application User Interface



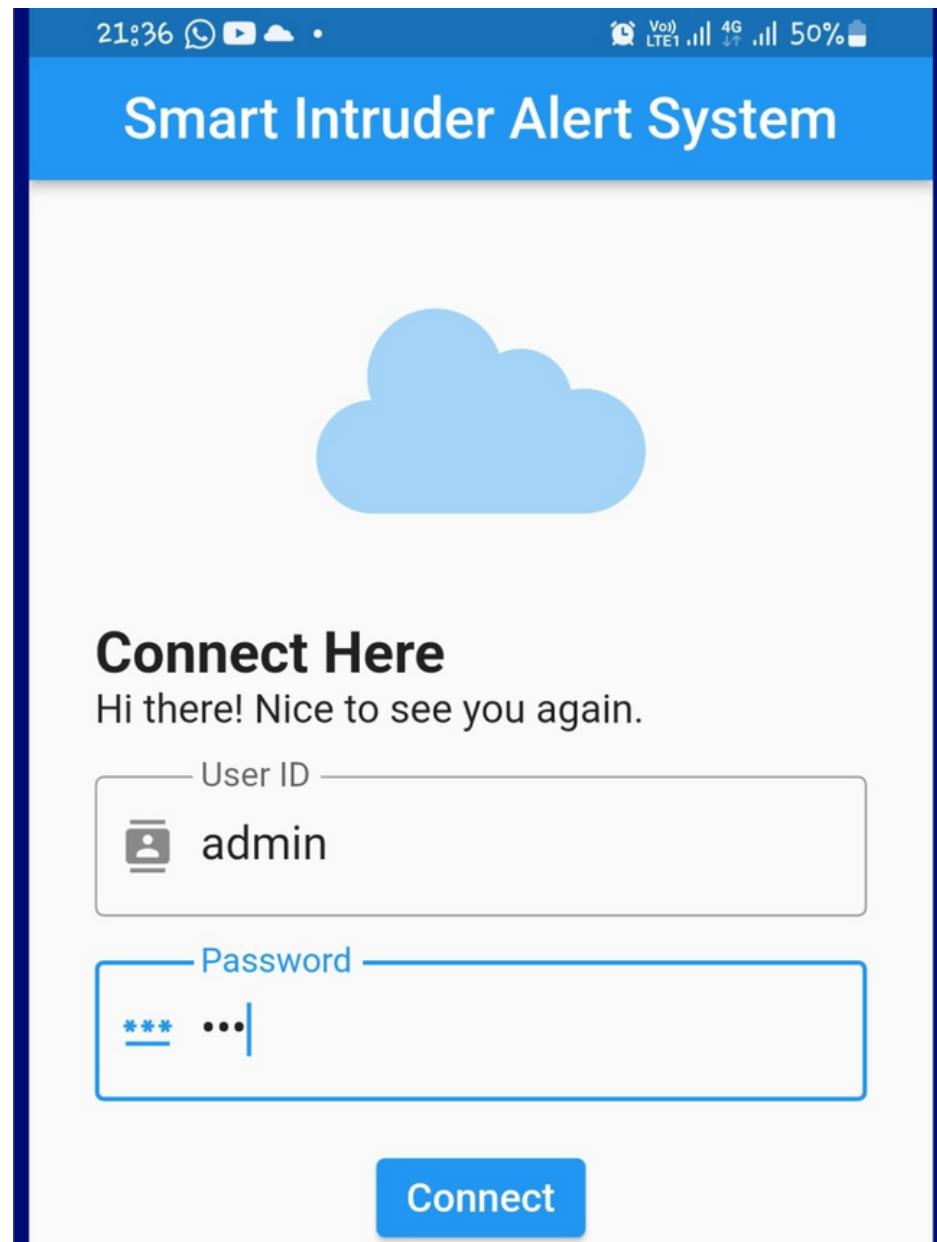
←  
**Login interface**

→  
**Notification  
interface**

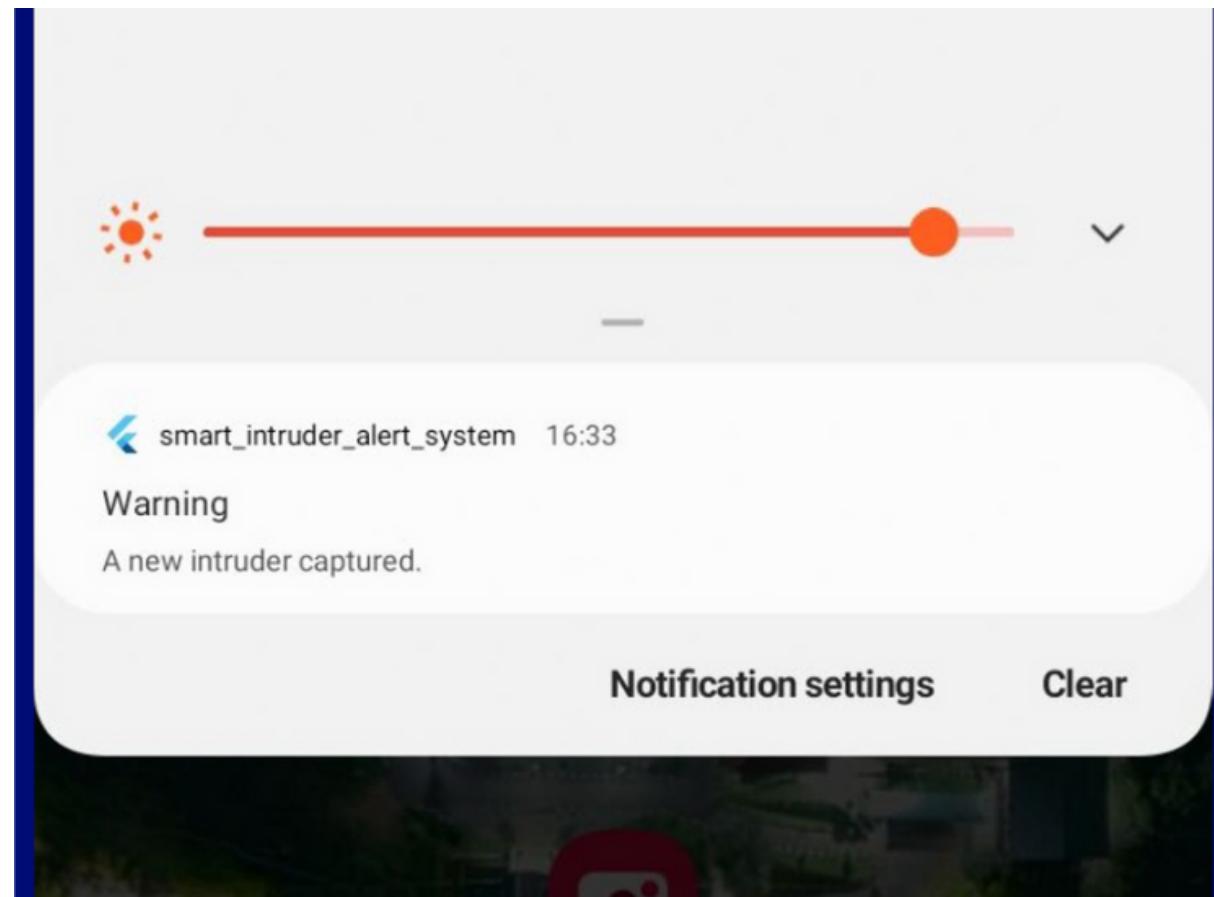


# IMPLEMENTATION

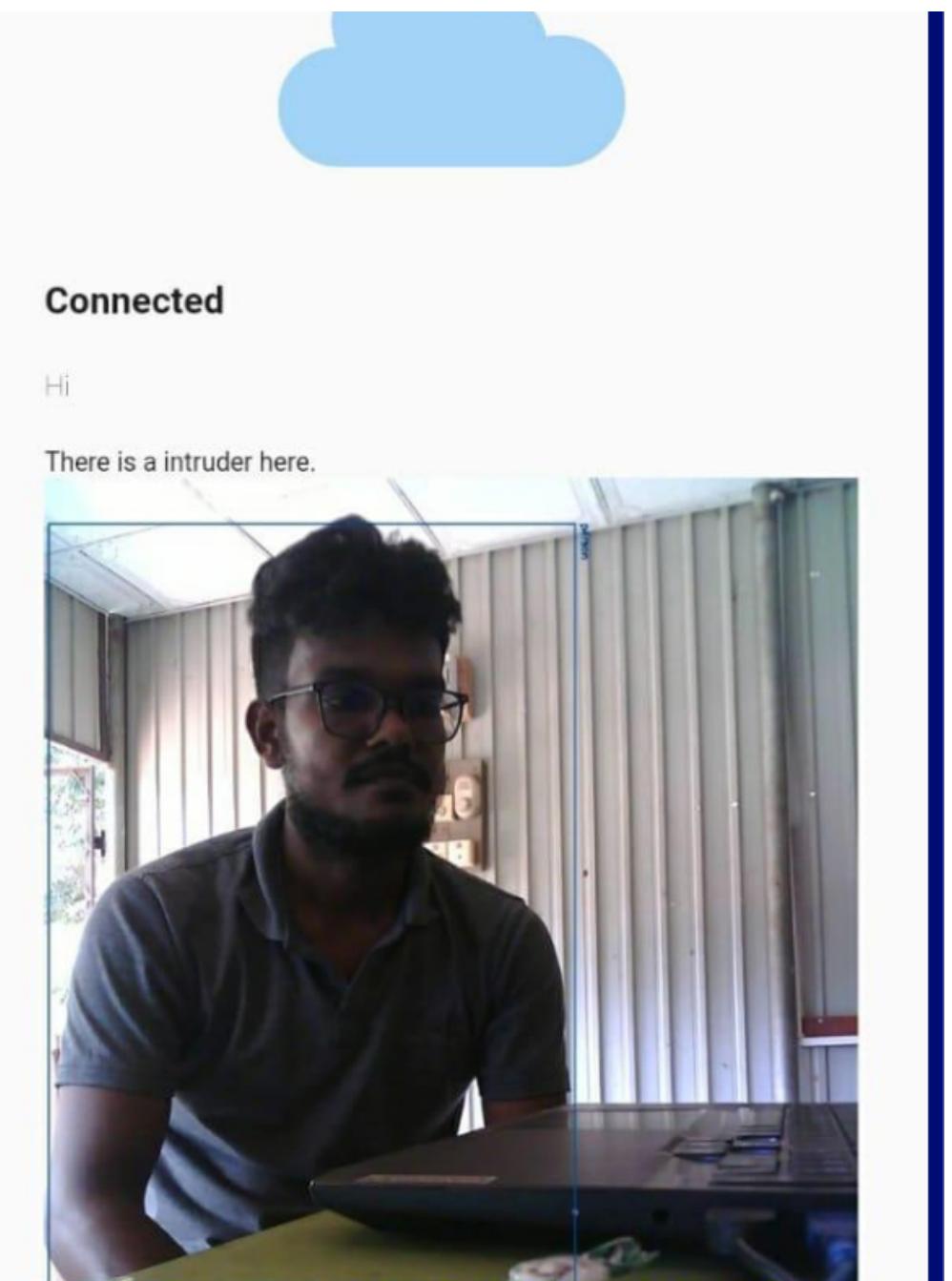
## Mobile Application User Interface



Logging in using user id and password



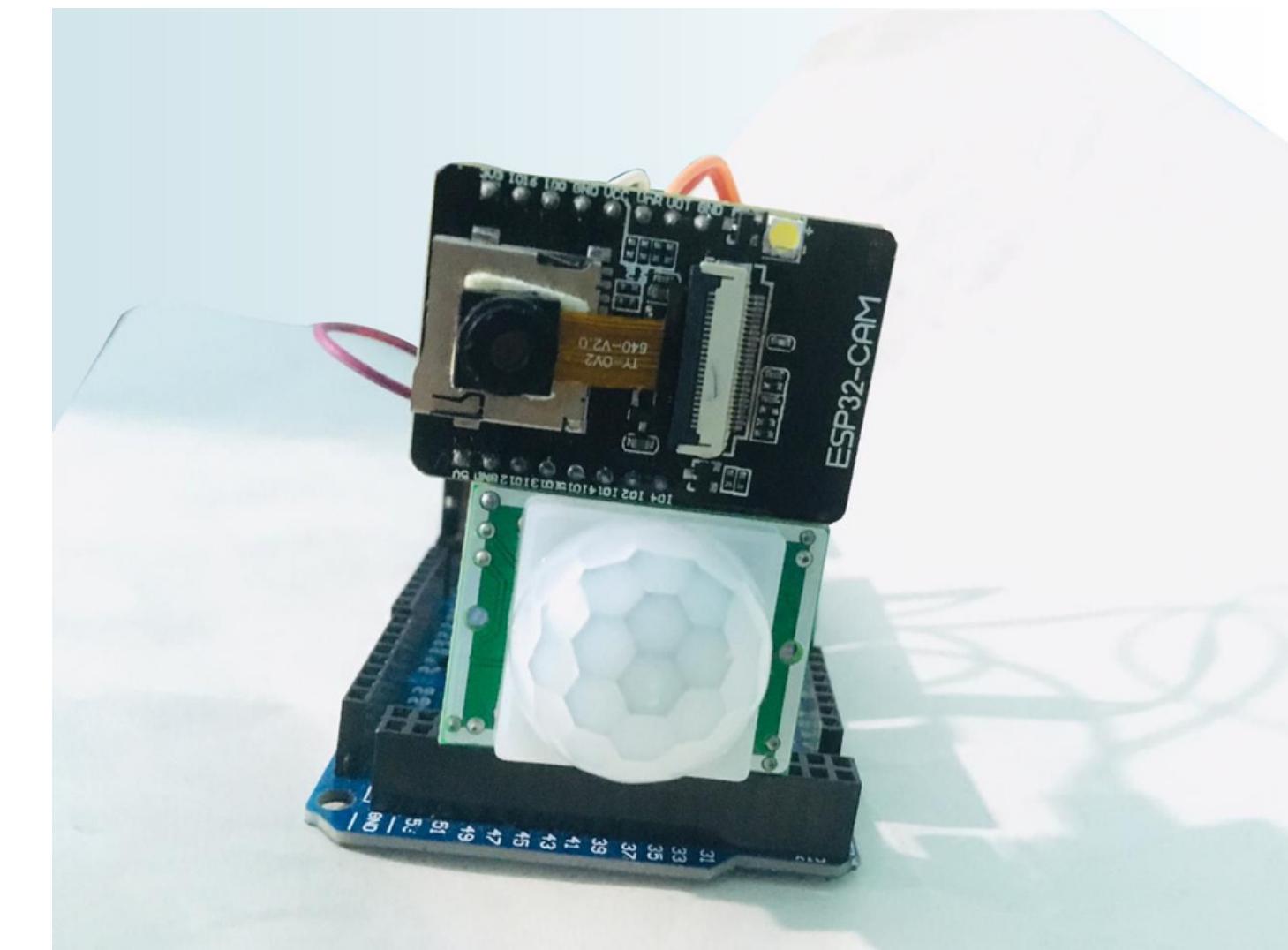
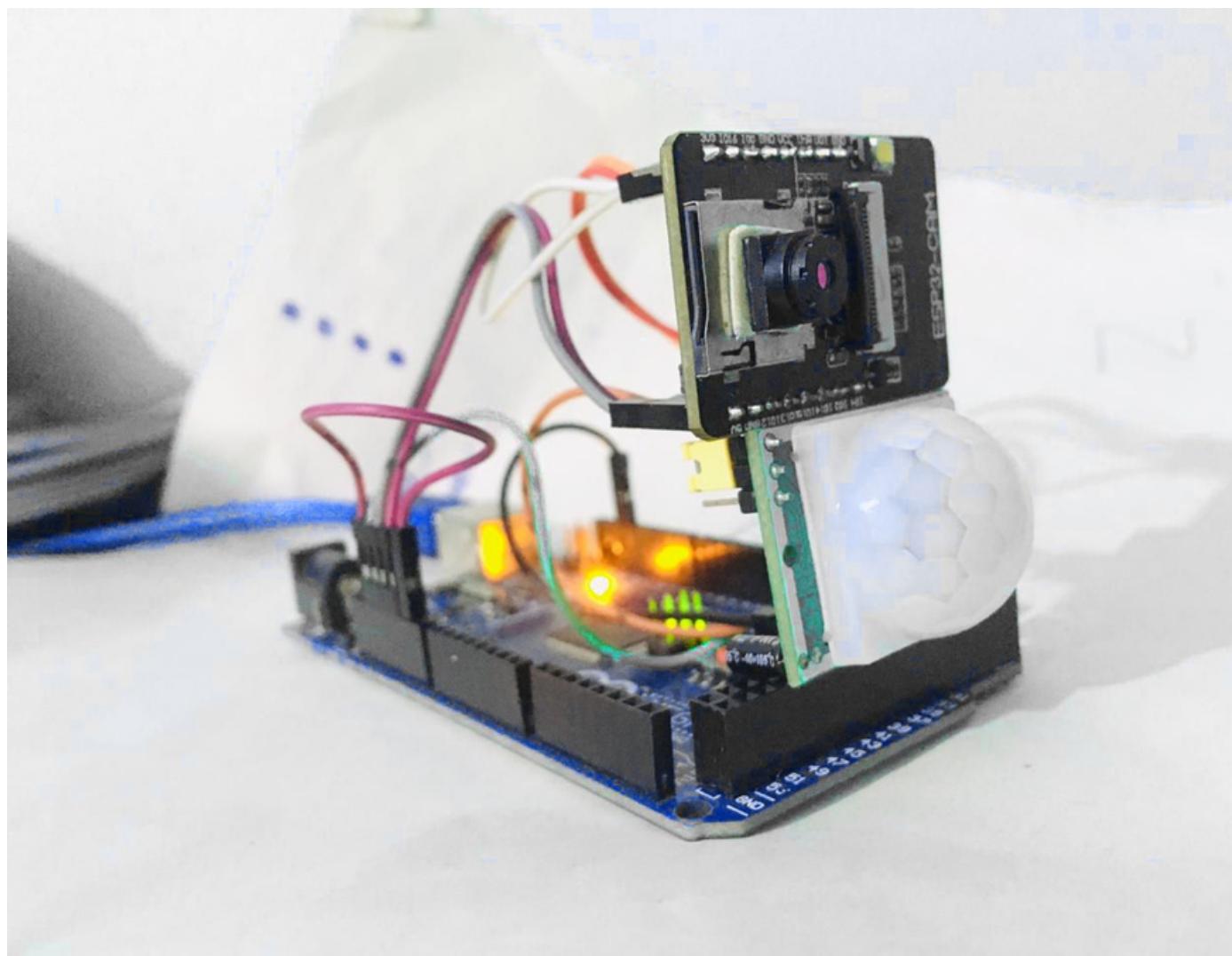
Notification Received



Intruder's Image

# IMPLEMENTATION

## Device Setup

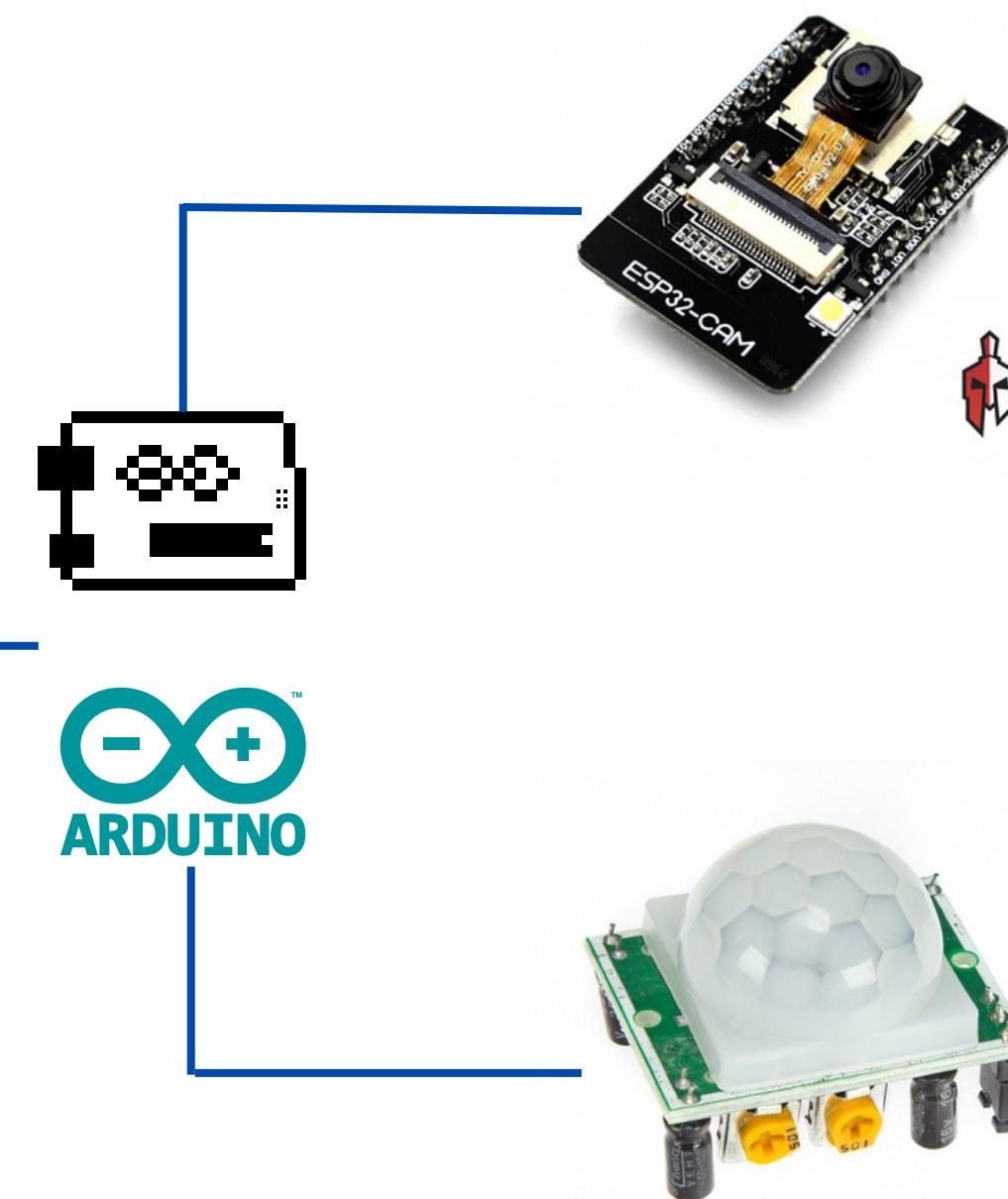


# IMPLEMENTATION

## ARDUINO IDE For programming ESP32 Cam

```
...  
.599 -> Motion detected.  
.760 -> FILE: photo.jpg  
.760 -> Taking a photo...  
.760 -> Picture file name: /data/photo.jpg  
.190 -> The picture has been saved in /data/photo.jpg - Size: 94208 bytes  
.450 -> FILE: photo.jpg  
.444 -> Uploading picture...  
.715 -> Download URL: https://firebasestorage.googleapis.com/v0/b/smartin  
.745 -> ets Jun  8 2016 00:22:57  
.745 ->
```

Serial Monitor Output



# FUTURE WORKS



To increase the sensing area of the PIR sensor, we can use the PIR array instead of using one PIR sensor.  
That will increase the detecting range of the system.



We can advance the project to the door (lock and unlock activity) so that the chance of theft or stranger activities will be reduced.



As it is still an image, we will provide the live streaming of the camera and provide options to save the particular frames of that stream.

# CONCLUSION

-  We conclude that our system can achieve all the objectives that we mentioned earlier and it can overcome most of the difficulties listed.
-  Moreover, we are able to identify any intruders present in the premises. With the detection of intruders, we can take necessary actions regarding the situation..
-  The system has been developed to detect only human intruders apart from animals and send immediate alerts to the owner about the intruder.

# REFERENCES

-  “An IoT-based House Intruder Detection and Alert System using Histogram of Oriented Gradients”  
<https://thescipub.com/pdf/jcssp.2019.1108.1122.pdf>
-  [https://www.researchgate.net/publication/354297728\\_IoT\\_Based\\_Smart\\_Intruder\\_Detection\\_System\\_For\\_Smart\\_Homes](https://www.researchgate.net/publication/354297728_IoT_Based_Smart_Intruder_Detection_System_For_Smart_Homes)
-  <https://www.sciencedirect.com/science/article/pii/S1877042810000236?via%3Dhub>

# THANK YOU!!

IN THE FUTURE TECHNOLOGY IS DEVELOPING VERY FAST