



# ADS

## Authorized Detection System

"Empowering Secure Environments with Advanced Detection Technology"

by Group 4

Guided by  
Dr.Bhanu Chander Sir,

~Tanuj(BCY18)	~Ajay(BCY32)
~Priyatham(BCY16)	~Shivani(BCY6)
~Revanth(BCY37)	~Suhash(BCY4)

# Introduction

- ADS (**Authorized Detection System**) is a project that aims to simplify the process of checking presence of a person in the designated room.
- By using a combination of motion detection technology (**PIR sensor**) and **Bluetooth connectivity**, the system allows students to easily determine if a faculty member is in their cabin in a web portal.
- This project serves not only for technological security but also enhances **physical security measures** in the faculty cabin.

## Significance

- Saving time for the students by informing the **faculty presence** in the cabin by visiting the portal instead of going and checking physically.
- **Real-time information** about faculty availability and location.
- **Intrusion notification** to the faculty if someone enters their cabin in their absence.

## Motivation:

- To tackle the challenge of efficiently **determining faculty presence**.
- **Reduce dependence** on manual searches or phone calls for verifying faculty locations.
- Improve the overall **efficiency** of interactions between faculty and students.
- To ensure **physical Security**.

## Novelty:

- As this module and server both work on the same network, this application **doesn't need Internet connectivity to run**.
- Besides simplifying faculty member location, it functions as an **anomaly detection** system.
- **Prompt notification** to faculty authorities in case of unauthorized entry.
- Dual functionality sets ADS apart, ensuring both **efficiency and campus security**.



# Problem Statement

- **Problem Addressed:**

- **Inefficiency in locating** faculty members on a college campus.
- Security concerns associated with existing methods.
- **Lack of precision and time-consuming** nature of current approaches.

- **Project Objective:**

- Develop the Authorized Detection System (ADS) to tackle these challenges.
- Provide a **simplified, accurate, and time-saving** solution for students to determine faculty availability in their cabins.
- Enhance campus security through **anomaly detection**.

- **Project Impact:**

- **Optimizing communication** and efficiency in the college environment.
- Addressing the need for improved security measures.
- Offering a comprehensive solution to both faculty availability and security challenges.

# Literature Review



- **IoT based intrusion detection system using PIR sensor**

4th International Conference on Computer Science and Computational Intelligence 2019 (ICCSCI), 12–13 September 2019

[Link to Research paper](#)

- **IoT-based Dual Technology Motion Detector**

4th International Conference on Design and Manufacturing Aspects for Sustainable Energy (ICMED-ICMPC 2023)

[Link to Research paper](#)

- **IoT-based occupancy detection system in indoor residential environments**

Building and Environment  
Volume 132, 15 March 2018, Pages 181-204

[Link to Research paper](#)



# Architecture



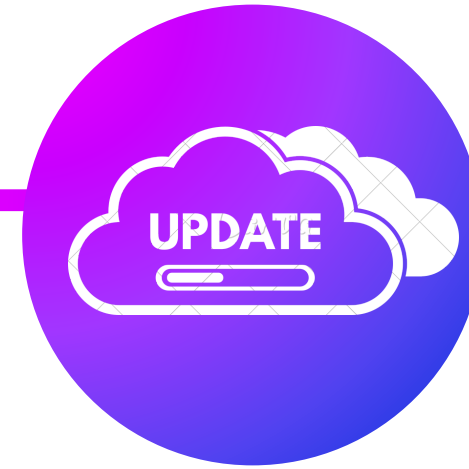
## Faculty Cabin Integration:

**Sensors** and connectivity systems are installed within faculty cabins, ensuring precise data collection and transmission.



## Student Portal

Students access the system via a **dedicated website** on their smartphones, providing a user-friendly interface for checking faculty availability.



## Real-time Updates:

The system provides **instant**, up-to-the-minute information on faculty cabin occupancy, allowing students to make informed decisions quickly.



## Anomaly Detection:

In cases of **unauthorized entry** into faculty cabins, the system promptly triggers security alerts to maintain a safe and secure campus environment.



# Protocols

01

**Transport Layer Security (TLS):** To **encrypt data transmission** and ensure secure communication between devices and the central server.

02

**Anomaly Detection System :** We are using an ADS to detect and respond to unauthorized persons via bluetooth connectivity which will verify it in the database.

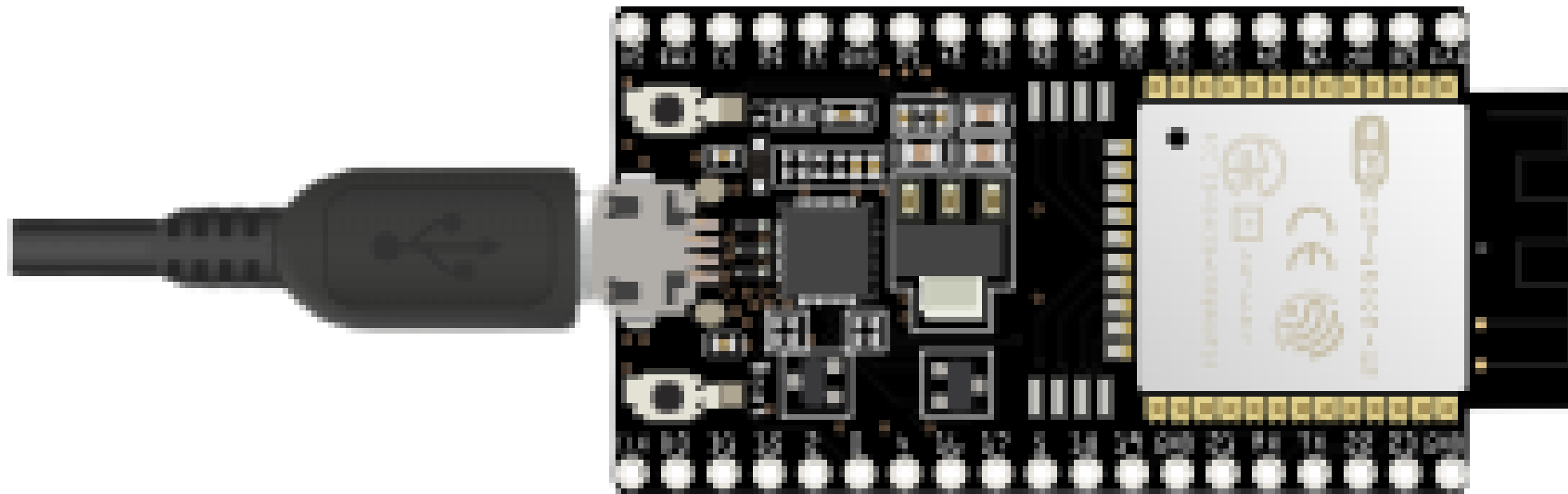
03

**Data Encryption Standard :** Using SHA252 encryption for data stored on the central server to protect sensitive information.

# Demonstration



# ESP 32



The **ESP32** Dev Kit is a versatile microcontroller module that integrates **Wi-Fi and Bluetooth capabilities**. Known for its compact size and low power consumption, it is widely used for Internet of Things (IoT) projects, offering a cost-effective solution for wireless connectivity and embedded applications.

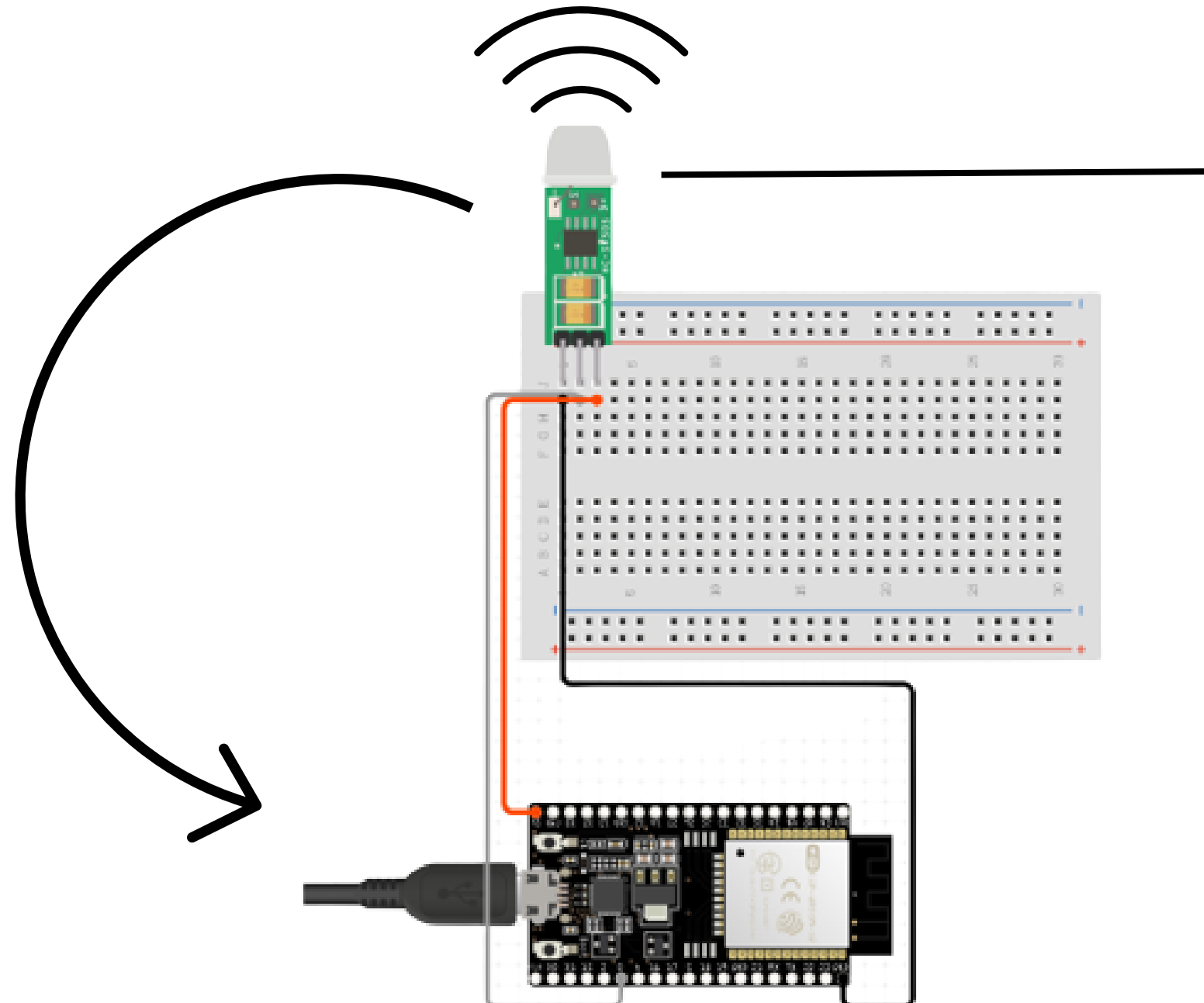
# PIR HC-SR505



The **PIR (Passive Infrared)** HCSR505 sensor is a motion detection module commonly used in electronic projects. Compact and cost-effective, it detects changes in **infrared radiation** within its range, making it ideal for applications such as security systems and automatic lighting. The HCSR505's passive nature allows it to operate with minimal power consumption, making it a popular choice for motion-sensing applications in the realm of electronics and IoT.

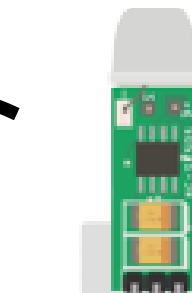
PIR Sensor runs and detects if there is any motion, regularly.

if detects, the sensor sends to module that "Motion Detected"



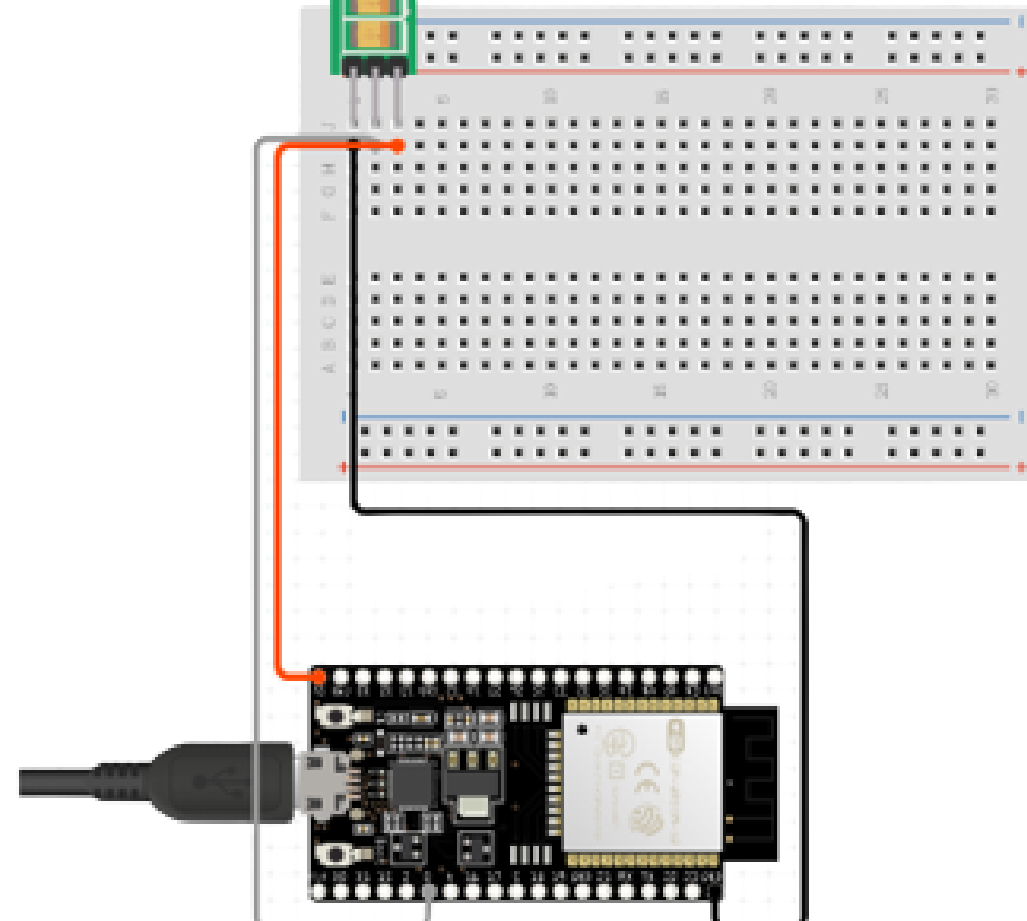
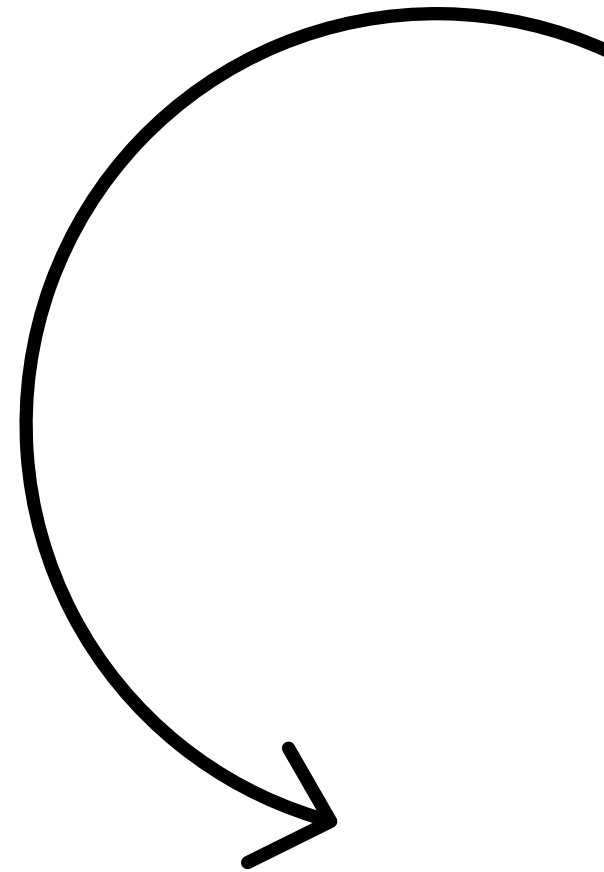


Intruder

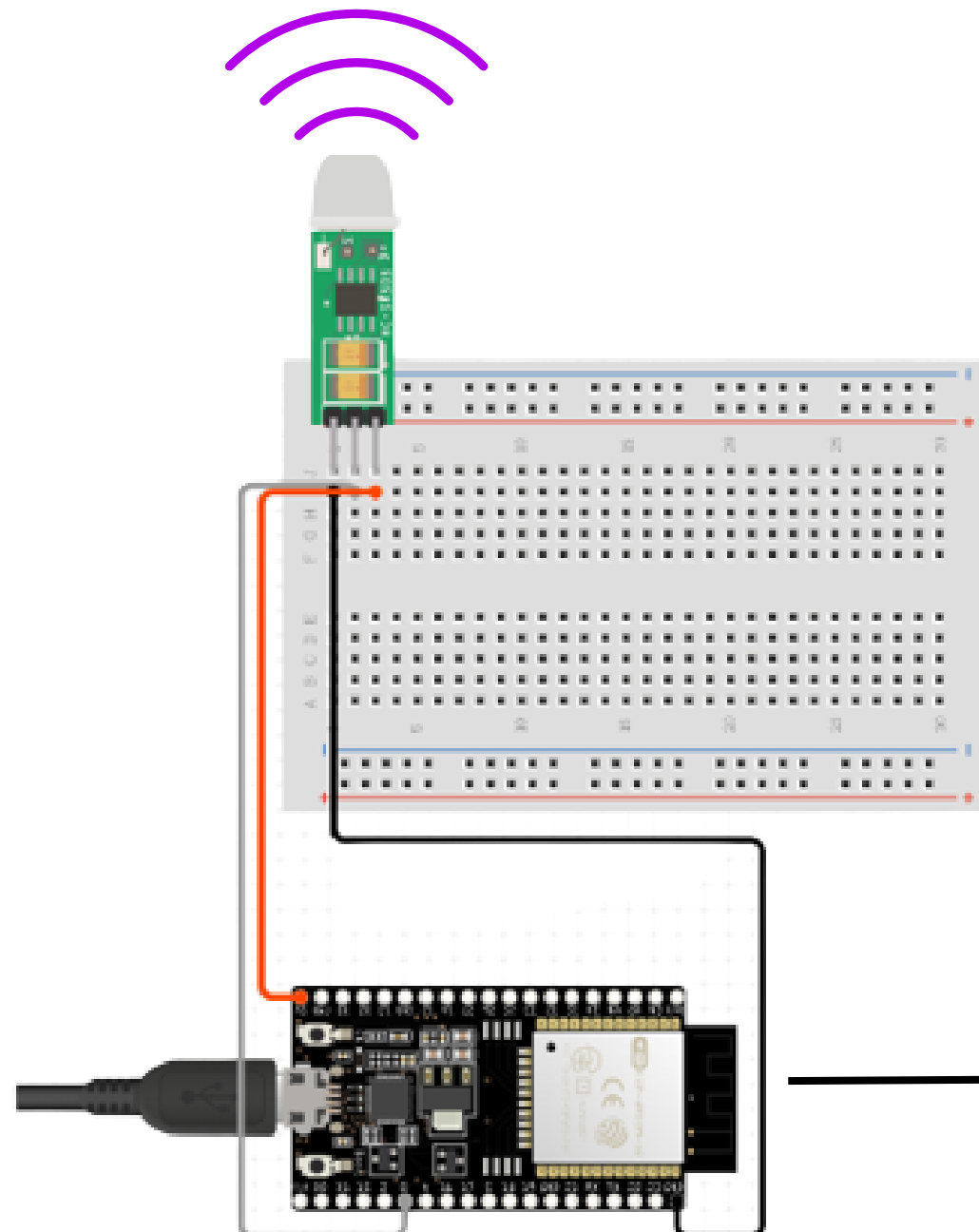


PIR Sensor Detects motion

Sensor sends to module that  
"Motion Detected"







Now, the bluetooth sensor which is inbuilt inside the ESP32 module will start **discovering bluetooth devices**.

If it discover any device, the wifi sensor will **send that device bluetooth address to our server**.

Our server will **match that bluetooth address** to the devices in which we already registered.

If it is a match, then it is some faculty.

If not, our server will send **notification about Anamoly alert**

We caught the culprit....!

D.I.S.C.O



Based on the time of intrusion  
detected, we can catch the culprit

# Challenges faced”

- **Creating SSL Certificate**
  - Planned to create an SSL Certificate for secure communication, “https” but failed to establish certificate, we are using “http”.
- **Push Notifications:**
  - Worked on Push notifications and researched different methods using sockets, and socket programming, but failed to incorporate this as of now - **Future Work**



# Conclusion

- **Achievements with ADS:**

- Significant advancement in **efficiency, communication, and security** on the college campus.
- Integration of motion detection technology, Bluetooth connectivity, and robust security measures.

- **Key Features:**

- Simplification of faculty location through motion detection.
- Streamlining of student-faculty **communication**.
- Assurance of faculty members **safety** and cabin security.
- **No Internet is required.**
- This can be even used in industries to monitor whether a authorized person in the assigned room through a portal.

It's not a complete project, it's an approach using PIR, Esp32 with low cost.  
Open For Suggestion





**Special Thanks to Dr. Bhanu Chander Sir  
for supporting us and guiding us throughout the project.**



**Thank you**