FINAL PROJECT IOT

CAPTURME

TEAM MEMBERS

01

STEFANUS SIMON RILANDO
2206830422

02

GIOVAN CHRISTOFFEL SIHOMBING
2206059566

03

NICHOLAS SAMOSIR
2206059396

04

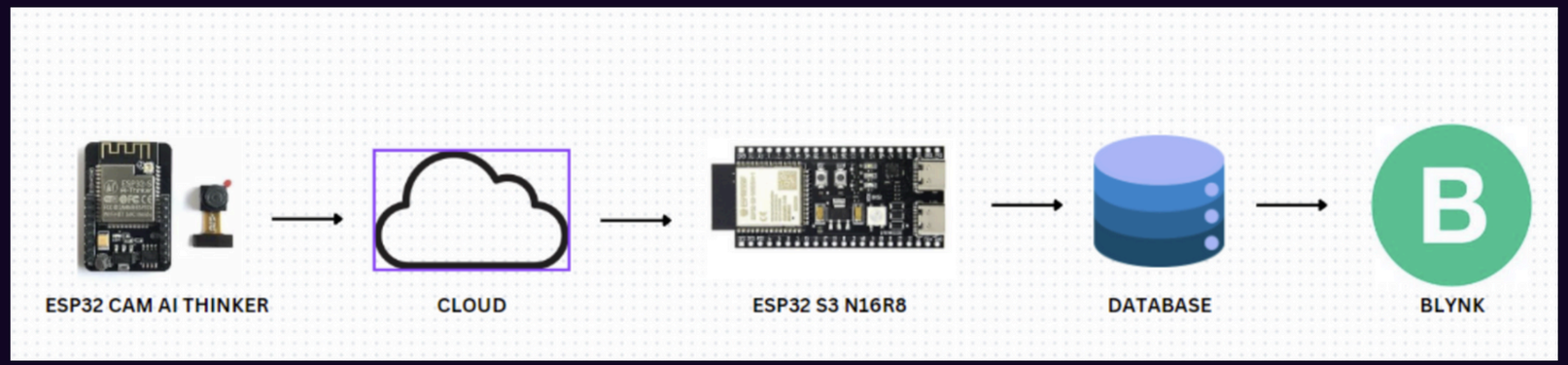
KEVIN NAUFAL ARYANTO
2206062850

PROBLEM STATEMENT

Traditional surveillance systems rely on CCTV cameras for video capture, requiring manual monitoring and analysis, which delays real-time responses and reduces security effectiveness. They lack automatic detection of human presence, making them inefficient for high-security environments. Manual operator-based monitoring increases error risk and slows response to unusual events. Notifications are also manual, limiting the ability to address threats or critical events promptly.

SOLUTION

CaptureMe utilizes many hardware and software to implement an automated surveillance system. ESP32-CAM AI Thinker is used as the main camera equipped with a wifi module to capture videos and detect the presence of people using AI-based object recognition technology. Detection results will be sent to ESP32-S3 N18E8 which is used for data processing and server connection. Server is tasked to receive data from ESP32-S3 for further processing and sends real-time notifications to Blynk, allowing users to receive information of how many people that are detected and display the face of each person detected.



TOOLS

01

BLYNK

02

ARDUINO IDE

TIMELINE

	November						Desember											
Task Title	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12
Hardware Design Completion																		
Software Development																		
Integration and Testing of Hardware and Software																		
Final Product Assembly and Testing																		

USER MANUAL

CaptureMe is an advanced automated surveillance system designed for real-time monitoring and notifications. This manual provides step-by-step guidance on how the system components interact and function together to ensure seamless operation. The system leverages ESP32-CAM, a robust microcontroller with a built-in camera, and ESP32-S3

- ESP32-CAM is configured as a web server, enabling it to capture images and provide them for further processing. This camera module streams live video feed and allows a server to request and access real-time image data.

- A server is programmed to request the live video stream from the ESP32-CAM. Once the stream is obtained, the server analyzes the data using AI-based object detection algorithms to identify and track the presence of individuals in the frame.

- ESP32-S3 N18E8 acts as the root controller in this system. It requests processed data from the server, including detection details such as the number of people identified and their facial images.

- ESP32-S3 sends the server's response to the Blynk application. This enables users to receive real-time notifications on their mobile devices, displaying the count of detected individuals and their corresponding facial images for easy identification.

TESTING (ESP32-S3)

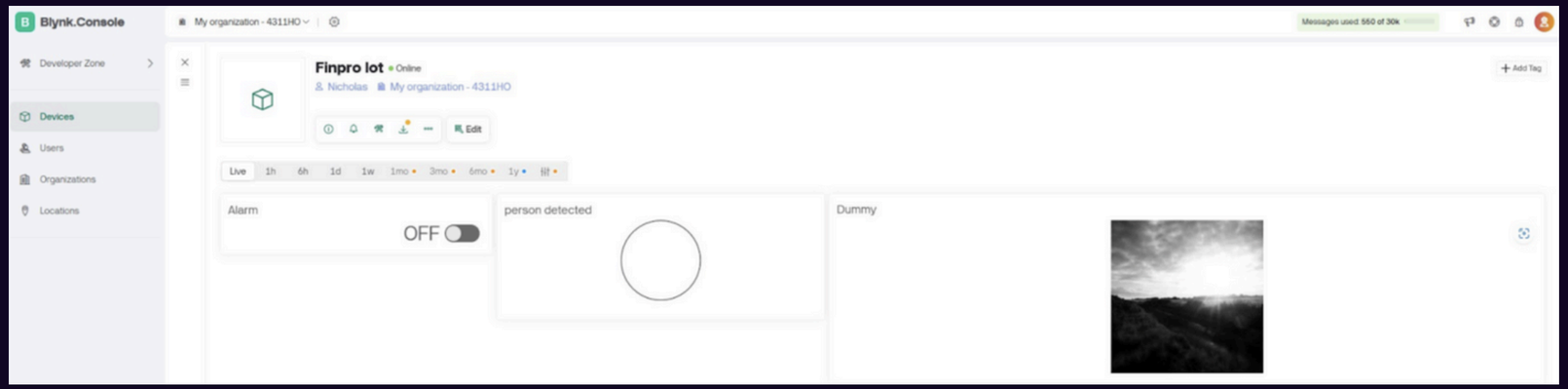
- Verifying data reception from ESP32-CAM
- Testing data transfer via GPIO and Wi-Fi
- Ensuring data processing and transmission to the server without delay
- Testing real-time notifications to the Blynk app
- Stability testing under varying Wi-Fi conditions

TESTING (ESP32-CAM)

- Testing image quality under various lighting conditions
- Evaluating flash performance in low-light environments
- Face detection testing using AI-based object recognition technology
- Ensuring stable video streaming through the web interface
- Adjusting settings such as brightness and resolution for optimal performance
- Testing flash control in dark environments

RESULT

The results of the project demonstrate the successful integration of the ESP32-S3 and ESP32-CAM modules with the Blynk platform, providing real-time monitoring and notification capabilities. The Blynk Console effectively displays a counter for person detection, incrementing each time the ESP32-CAM identifies a person. This feature ensures accurate tracking of detected events for analysis and optimization. Additionally, the console showcases a list of captured images from the ESP32-CAM, allowing users to visually verify detection accuracy. Alongside these features, an alarm status switch is available, enabling users to remotely toggle the alarm on or off, enhancing system flexibility and user convenience. The system's online status is also clearly displayed, confirming the active connection of the ESP32-S3 module. This seamless integration highlights the effective functionality of the hardware and software components, ensuring reliable performance and a user-friendly monitoring experience.



EVALUATION

The evaluation of the CaptureMe project highlights its effectiveness and reliability in real-time monitoring and security applications. The system integrates ESP32-S3 and ESP32-CAM modules, enabling person detection and high-quality image capture, ensuring clear and identifiable results. Real-time monitoring is facilitated through the Blynk platform, where users can track detections, view captured images, and receive immediate notifications via the alarm function. The detection counter provides accurate, real-time feedback on system activity, enhancing usability. The ESP32-S3 efficiently processes detection data and transmits images without significant delays, while the Blynk Console offers a user-friendly interface for managing the system and reviewing a history of detections. The seamless integration of hardware and software ensures smooth operation, with the system demonstrating high accuracy and reliability. These features make CaptureMe a practical and valuable solution for surveillance and security purposes.

THANK YOU