Smart Home Security System

Minor Project-I Report

Submitted for the partial fulfillment of the degree of

Bachelor of Technology

In

Internet of Things (IoT)

Submitted By

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0901IOT221052

UNDER THE SUPERVISION AND GUIDANCE OF

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MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA

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I hereby declare that the work entitled **Smart Home Security System** is my work, conducted under the supervision of **Dr. Namita Arya, Assistant Professor,** during the session Jun-Dec 2024. The report submitted by me is a record of bonafide work carried out by me.

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ABSTRACT

[illegible] Smart Home Security System is a comprehensive and innovative solution [illegible] enhance the safety and security of residential properties. The project integrates [illegible] computer vision techniques and motion detection technology to provide real-time [illegible] and alert capabilities.

[illegible] the YOLO (You Only Look Once) object detection model to identify and [illegible] in video feeds, ensuring accurate and efficient monitoring. [illegible] PIR (Passive Infrared) sensor is employed to detect motion, triggering [illegible] when unauthorized movement is detected.

[illegible] the system is developed using Python and Flask, allowing seamless [illegible] hardware components and efficient handling of data. The frontend, built with [illegible] users with an intuitive and interactive interface to monitor live video feeds [illegible]

[illegible] development process, extensive testing and evaluation were conducted to [illegible] reliability and performance. User feedback was incorporated to refine the [illegible] and enhance the user experience.

[illegible] Smart Home Security System represents a significant advancement in home [illegible] offering users a robust and user-friendly solution to safeguard their [illegible] details the project's objectives, system design, implementation, and [illegible] providing a comprehensive overview of the development and its outcomes.

ACKNOWLEDGEMENT

The full semester Project has proved to be pivotal to my career. I am thankful to my ..., **Madhav Institute of Technology & Science** to allow me to continue my ...nary/interdisciplinary Project as a curriculum requirement, under the provisions of the ... Curriculum Scheme approved by the Academic Council of the institute. I extend my ...le to the Director of the institute, **Dr. R. K. Pandit** and Dean Academics, **Dr. Manjaree** ... for this.

I would sincerely like to thank my department, **Centre for Internet of Things,** for ...g me to explore this project. I humbly thank **Dr. Praveen Bansal**, Assistant Professor ...ordinator, Centre for Internet of Things, for his continued support during the course of ...gagement, which eased the process and formalities involved. I am sincerely thankful to ...culty mentors. I am grateful to the guidance of **Dr. Namita Arya**, Assistant Professor, ...entre for Internet of Things, for his continued support and guidance throughout the ...t. I am also very thankful to the faculty and staff of the department.

Amit

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CERTIFICATE

This is to certify that Amit Kumar Prajapati, a student of Internet of Things (IoT), 5th Semester at Madhav Institute of Technology and Science, Gwalior, has successfully completed the Minor Project – I titled "Smart Home Security System" during the academic session 2024-25 under the guidance of Dr. Namita Arya, Assistant Professor.

The project, developed using HTML, Python, and YoLo, showcases the student's ability to design and implement a web-based application for Anonymous detection, addressing a real-world problem with practical and innovative solutions.

We commend the student's dedication and technical skills in completing this project.

30-11-24.

Dr. Namita Arya
Assistant Professor

CONTENT

CHAPTER 1: INTRODUCTION

1.1 Overview of the Project

The SecureNest Smart Home Security System is designed to enhance residential security by integrating computer vision and motion detection technologies. Utilizing the YOLO (You Only Look Once) model for object detection and a PIR (Passive Infrared) sensor for motion detection, the system provides real-time surveillance and alerts. The backend is developed using Flask, and the frontend is built with React, ensuring a seamless and user-friendly experience.

1.2 Problem Statement

With the rise in home security concerns, traditional systems often fail to provide timely alerts and accurate detection. There is a need for an advanced automated system that offers real-time surveillance and prompt alerts to ensure the safety of residents and their properties.

1.3 Objectives of the Project

- **Real-Time Surveillance**: Provide continuous monitoring via live video feeds.
- **Accurate Object Detection**: Implement YOLO for precise human detection.
- **Motion Detection**: Utilize a PIR sensor to detect movement and trigger alerts.
- **User-Friendly Interface**: Develop an interactive web interface using React.
- **Seamless Integration**: Integrate YOLO, PIR sensor, and camera feed into one system.
- **Robust Alert System**: Send real-time alerts for detected motion or unauthorized entry.

1.4 Scope of the Project

- Development of a comprehensive security system integrating object detection and motion detection.
- Providing a live video feed with real-time alerts via a web interface.
- Ensuring the system is user-friendly, reliable, and capable of scaling with additional features like multi-camera support and advanced alert mechanisms.

ANNEXURE

SELF-EVALUATION OF PROJECT

Month	Start date – End date (DD/MM/YY) - (DD/MM/YY)	Progress of Project
onth- 1	01/08/24 – 31/08/24	- Defined project scope and requirements. - Started developing the backend and frontend structure. - Initial research on YOLO and PIR sensor integration.
onth- 2	01/09/24 – 30/09/24	- Implemented YOLO-based object detection. - Integrated PIR sensor with Arduino. - Developed API endpoints using Flask. - Enhanced the frontend interface.
onth- 3	01/10/24 – 31/10/24	- Refined the user interface. - Implemented real-time alert system. - Conducted extensive testing and debugging. - Started preparing project documentation.
onth- 4	01/11/24 – 19/11/24	- Completed final testing and bug fixes. - Finalized project documentation. - Conducted user testing and reviewed system performance. - Prepared and submitted the Turnitin plagiarism report. - Finalized project for submission.

Arya 20-Nov-24

Dr. Namita Arya
Assistant Professor