



IOT Based Anti Theft System for Home

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ABSTRACT: The SMART Anti-Theft System is an advanced security solution designed to prevent unauthorized access and theft by leveraging modern technologies such as artificial intelligence, the Internet of Things (IoT), biometric authentication, and machine learning. Traditional security systems often fail to provide real-time alerts or adapt to evolving threats, whereas the SMART Anti-Theft System addresses these limitations through its integrated approach, offering comprehensive surveillance, detection, and response capabilities.

KEY WORDS: Real-time Monitoring, Camera Module, Cloud Storage, Secure Communication, Theft Prevention

I. INTRODUCTION

The increasing cases of theft and unauthorized access to private property have driven the demand for advanced security solutions. Traditional theft prevention methods, such as CCTV cameras and alarm systems, often lack real-time monitoring and remote-control capabilities. IoT-based anti-theft systems integrate sensors, communication modules, and cloud computing to provide real-time alerts and tracking mechanisms. This paper evaluates the challenges faced in implementing these systems and suggests strategies for mitigating them.

A. Types of Data Management Challenges

Insufficient encryption measures.

- Vulnerability to unauthorized access.
- Cyber security threats.
- Connectivity issue.

B. Motivation:

The motivation for an IoT-based Anti-Theft System stems from the need for more advanced, efficient, and flexible home security solutions. IoT technology connects various devices like smart cameras, motion sensors, alarms, and locks, allowing them to work together seamlessly. This integration provides real-time monitoring and immediate alerts, enabling homeowners to monitor and control their security system remotely via smartphones or other devices,

IoT-based systems offer greater convenience, as they can automate actions like turning on lights, locking doors, or triggering alarms when suspicious activity is detected. They also provide enhanced security, as they can instantly alert homeowners or authorities to any potential intrusions, reducing response times and minimizing the risk of loss.

Compared to traditional systems, IoT-based solutions are cost-effective, scalable, and easier to expand or customize as needed. This makes them a flexible choice for homeowners who want a more proactive, intelligent, and user-friendly security system, ensuring greater peace of mind.

C. Solution:

- Cloud Integration

- Standardized Protocols
- Implement Secure Defaults

II. SIGNIFICANCE OF THE SYSTEM

The aim of an IoT-based anti-theft system arises from the growing demand for more effective and flexible home security solutions in today's fast-paced world. Traditional systems often fall short in providing real-time monitoring, remote control, and automation, leaving homeowners vulnerable. Working professionals, who are frequently away from home, require systems that allow them to monitor and control security remotely. Elderly or vulnerable individuals benefit from automation and real-time alerts that ensure their safety without the need for manual intervention. Families with children need customizable security measures that offer peace of mind and control over home access. Ultimately, IoT-based systems address these needs by offering proactive, scalable, and convenient solutions that enhance security, flexibility, and ease of use for all types of homeowners.



Figure 1: System Significance

III. LITERATURE SURVEY

We have found different papers related to security system. Different security systems used for different purposes. Sushma .N. Nichal, Prof. J.K. Singh has done abstraction of Smart supervisor system using IOT based on embedded Linux O.S. with ARM11 architecture. In this Paper they have implemented real-time video monitoring system and acquired data. In this system they have also used PIR, temperature, Humidity sensors the system first requires authentication from user to activate the system if the system detect human it will send that data to the server or user smart phone.

Yogita Vijay Narkhede, S. G. Khadke have presented smart security system with Raspberry Pi and IR sensor if IR sensor detects the person camera will capture image as well as video of the person, the data then encrypted first and then decoded. User will get notification on his mobile device. Authors discussed that user can also perform the live streaming and provide security. Authors have concluded that this system is important for commercial places; they have discussed few advantages of the system.

Harikrishnan G.R. et al have implemented home automation and security system in this system user can continuously monitor home from remote location if the intruder detected system will generate alarm and captures the image of the intruder and the captured image will be The development of SMART Anti-Theft Systems has been an area of growing interest in both academic research and industry, driven by the increasing need for more sophisticated security solutions.

This literature survey reviews various studies and advancements in the field, focusing on key technologies and approaches that contribute to the effectiveness of these systems.

They have discussed few advantages of this system. Authors have concluded that this system is useful for securing commercial places.

R.Chandana et al have implemented monitoring and home security system using think and speak with the help of raspberry Pi, they have used Gyro sensor to detect the movements of person if the movements is detected camera will be captured image and the image will be send to the owners mail id with captured image.

They have also stated some importance of this system. Authors have concluded that this system is important for security purpose. K

Saravana Kumar et al have developed the security system with proximity sensor, Raspberry Pi, and Camera, proximity sensor detect the person after detecting the person camera will be initiated and capture the image and image will be uploaded to drop box and user gets the notification about the intruder in the form of SMS. They have discussed few advantages like cost effective, portable. Authors concluded that this security system is useful for security of homes.

IV. METHODOLOGY

An IoT-based anti-theft system integrates smart sensors, cameras, and cloud-based alerts to detect and prevent unauthorized access to a home.

1. System Design & Components Selection
2. Installation & Deployment
3. Data Collection & Processing
4. Alert Mechanism & Automation

A. System Architecture

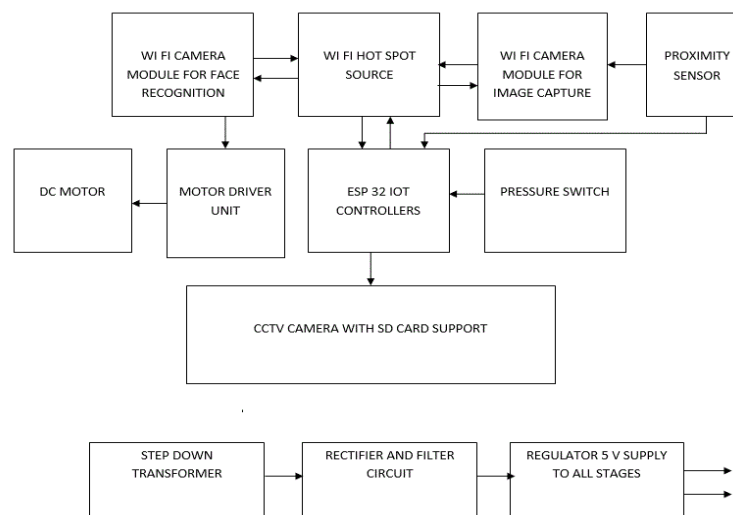


Figure 2: Architecture Diagram

1. **Sensing Module** – Detects unauthorized access using motion sensors, vibration sensors, and door/window contact sensors.
2. **Camera & Image Processing Module** – Captures real-time footage, utilizes AI for intruder recognition, and supports night vision.
3. **IoT Gateway & Communication Module** – Transmits data between sensors, cloud, and mobile apps via Wi-Fi, Zigbee, or LoRaWAN.
4. **Cloud Storage & Data Processing Module** – Stores security data, processes alerts, and enables real-time analytics.
5. **Alert & Notification Module** – Sends real-time alerts via SMS, email, and mobile push notifications while triggering alarms or sirens.
6. **Smart Lock & Home Automation Module** – Controls smart locks, integrates with voice assistants, and automates home security actions.
7. **Mobile App/Web Dashboard Module** – Provides remote monitoring, live streaming, and system control through an intuitive interface.
8. **Security & Encryption Module** – Ensures secure communication using AES-256 encryption, multi-factor authentication, and HTTPS.
9. **Power Management & Backup Module** – Maintains system functionality with battery backups and alternative power sources like solar energy

Use Case Diagram for IoT-Based Anti-Theft System

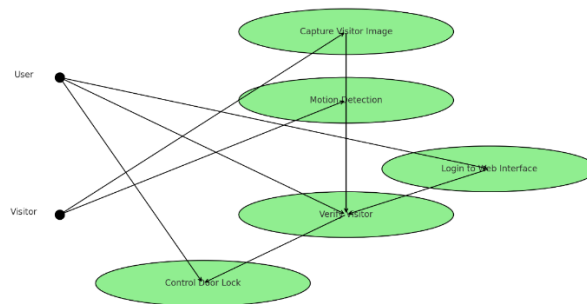


Figure 3: Publish Subscribe Architecture



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V. CONCLUSION AND FUTURE WORK

These references provide a comprehensive foundation for the development of the SMART Anti-Theft System, covering a wide range of topics from IoT security to user-centered design. Utilizing these resources ensures the project is informed by current research, industry standards, and emerging technologies, ultimately leading to a more effective and reliable security solution.

Despite the advancements in SMART Anti-Theft Systems, several challenges remain. Issues related to system integration, interoperability between devices from different manufacturers, cybersecurity threats, and user privacy need to be addressed. Future research, as suggested by Singh et al. (2022), should focus on developing standardized protocols for IoT devices, enhancing AI algorithms to reduce false positives and negatives, and improving user privacy protections.

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VII. REFERENCES

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