SMART ANTI-THEFT CONTROL SYSTEM USING IoT

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Keywords:

ESP8266,ESP32 CAM, PASSIVE INFRARED, LIGHT DEPENDENT REGISTER, FIREBASE, TELEGRAM API

Introduction:

In an era where security is paramount and innovation is the cornerstone of progress, we unveil the "ANTI THEFT CONTROL SYSTEM USING IOT." Rooted in the relentless pursuit of safeguarding valuable assets, our project emerges as a beacon of ingenuity and resilience, poised to revolutionize the landscape of banking security. Inspired by seminal research in smart home security systems, our endeavor represents a fusion of visionary concepts and practical applications tailored to the unique challenges of securing bank lockers. Leveraging cutting-edge IoT technology, including motion detection sensors, facial recognition, and real-time communication protocols, our system stands as a testament to the power of innovation in addressing contemporary security concerns.

As we embark on this transformative journey, guided by a commitment to excellence and societal well-being, we invite you to delve into the intricacies of our project—a project that not only addresses pressing security challenges but also sets the stage for a future where safety, trust, and innovation converge to build a safer, more secure world for all.

Objectives:

Security Paradigm Redefined:Set new standards in bank locker security, revolutionizing theft prevention norms.
Cutting-Edge IoT Integration: Implement dynamic IoT technology for adaptive security measures against evolving threats.
Rapid Threat Response: Enable swift detection of security breaches, facilitating immediate alerts to authorities for prompt intervention.
Visual Evidence Expedited: Streamline investigation processes by providing authorities with conclusive visual evidence via Telegram and Firebase.
Tamper-Proof Design Assurance: Ensure uninterrupted system operation and deter tampering through robust anti-intrusion mechanisms, enhancing overall security integrity.

Methodology:

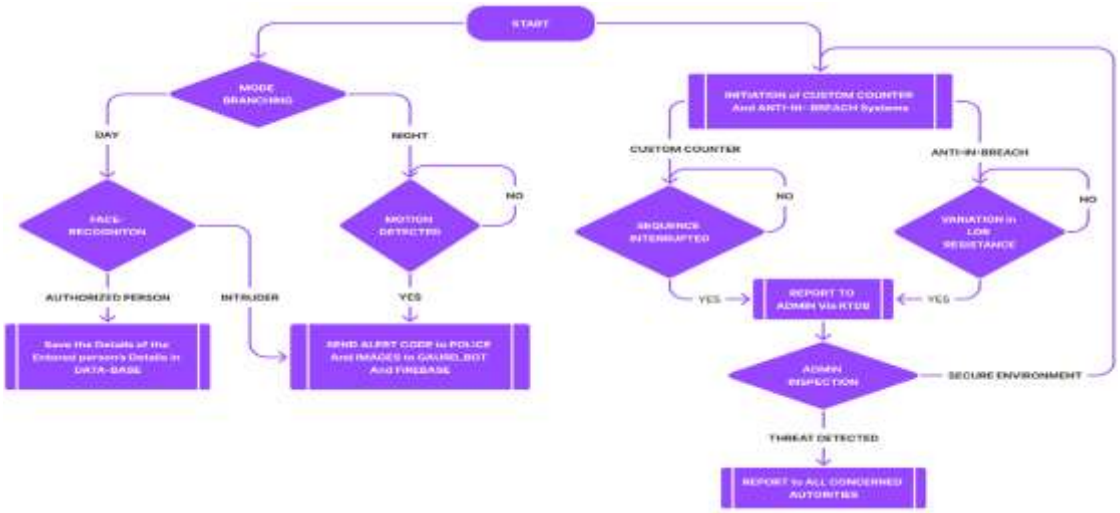

Fig.1 Flow chart of proposed process

Hardware Integration: Integrate ESP8266, ESP32CAM, LCD display, buzzer, PIR sensor, LED, and LDR to create a comprehensive hardwareunit.

Day and Night Mode Setup: Configure the system to operate in Day Mode and Night Mode, each with specific functionalities and protocols.

Motion Detection Algorithm: Develop a motion detection algorithm using the PIR sensor and ESP32CAM to trigger threat alerts during Night Mode.

Firebase Integration: Establish communication between ESP8266 modules and Firebase for real-time threat signal transmission and storage.

Telegram Bot Configuration: Set up a Telegram bot named "GAURD_BOT" for sending threat alerts and visual evidence to concerned officials and police personnel.

Anti-Intrusion Mechanisms: Implement anti-tampering measures like the Anti-In-Breach and Continuous-Connection protocols to ensure system integrity.

Facial Recognition Implementation: Integrate facial recognition technology during Day Mode for user authentication and access control.

Testing and Optimization: Conduct rigorous testing of the entire system to ensure functionality, reliability, and resilience under various conditions.

Documentation and Training: Prepare comprehensive documentation and provide training to users and stakeholders for system operation and maintenance.

Conclusion:

Swift Threat Detection: Our system successfully detects security breaches in real-time, triggering immediate threat alerts upon motion detection during Night Mode operations. This rapid response capability ensures timely intervention and minimizes the potential for loss or damage to valuable assets.

Visual Evidence Transmission: The integration of Firebase and Telegram facilitates seamless transmission of visual evidence to concerned authorities, providing irrefutable proof of security incidents. This capability streamlines the investigation process and expedites justice, enhancing overall security infrastructure.

Tamper-Proof Design: The implementation of robust anti-intrusion mechanisms, including the LDR-LED pair and continuous custom counter, ensures the integrity and resilience of the system against tampering or sabotage attempts. These measures serve as critical safeguards, maintaining the security and reliability of the system under diverse operational conditions.

User-Friendly Authentication: Facial recognition technology integrated during Day Mode operations enhances security while offering a user-friendly authentication experience for authorized individuals. This seamless authentication process minimizes friction and ensures hassle-free access to bank lockers.

Fig 2. Proof of visual evidences in Telegram Application

Fig 3. Showing the real time data base logs

In conclusion, the "ANTI THEFT CONTROL SYSTEM USING IOT" stands as a testament to innovation in banking security. Its advanced features, including motion detection, facial recognition, and real-time communication, position it as a pioneering solution in the market. Compared to existing models, our system offers unparalleled threat detection capabilities, proactive measures, and user-friendly interfaces, setting a new standard for security systems. As we anticipate widespread adoption and positive impact, we remain committed to advancing the field of security technology and ensuring the safety of assets and communities.

Scope for future work:

Societal Impact: Building Safer Communities.

Enhancing Safety Standards: Our "ANTI THEFT CONTROL SYSTEM USING IOT" is not just a security upgrade but a societal commitment, projected to significantly reduce theft-related losses in communities.

Public Trust: By fortifying security measures, our project aims to restore public trust in banking systems, fostering a sense of safety and security.

Vision for Advancement: Our project signifies visionary innovation, aiming not just for current security needs but setting a precedent for future security technologies.

Anticipated Impacts: Envisioning our system as a pioneering model, revolutionizing security practices nationally and beyond.