



## Society Management Application with Live CCTV Monitoring and Threat Detection

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**Abstract:** Our app society management combines live CCTV surveillance and robust threat detection for enhanced security and efficiency in community administration. The application thus offers society administrators and residents an opportunity for real-time video feeds from surveillance cameras on premise to maintain vigilance. It has features such as AI-based threat detection, which can utilize computer vision techniques such as object detection and motion tracking to identify potential security threats, such as unauthorized access, anomalous motion or dangerous objects such as weapons for example. Apart from this, the application also supports alerting messages, as well as notifications and emergency alerts for more effective management of residents for a safer and more organized stay. All these aspects put together serve as a holistic solution for modern residential communities.

**Index Terms-** Society Management, Threat Detection, CCTV Monitoring, Event Booking

### I. INTRODUCTION

Today, as more people live in cities and population densities rise, the need for better residential security is changing. Traditional security methods, like static cameras and manual checks, are not effective in quickly identifying or responding to threats, risking residents' safety. [1] This has led to the development of advanced technology-based solutions for residential security, especially in housing management. AI and deep learning are being integrated into security systems to tackle these issues. AI-driven monitoring uses advanced pattern recognition and image processing to detect threats with minimal human involvement. [2] Deep learning models like YOLOv8 excel at real-time object detection, making them suitable for identifying various threats. In the proposed "Housing Management System," YOLOv8 will be integrated into a mobile app designed with Flutter. This system will monitor video feeds from security cameras for dangers like fire, fights, or robbery. When a threat is identified, alerts will be sent to housing society managers for quick action. [5] The paper also reviews literature and technology related to deep learning in housing security, discussing the strengths and challenges of AI applications, including processing power and privacy concerns. [7] Overall, it aims to show how deep learning can transform traditional security into proactive solutions and improve living conditions in communities.

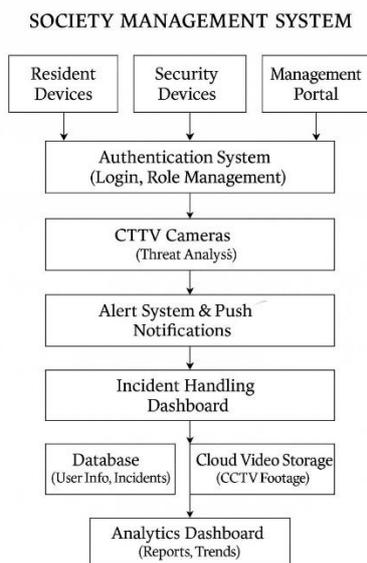


Fig. System Flow Chart

## II. RELATED WORK

Automating housing society operations, such as visitor management, complaint tracking, notice board updates, and payment processing, has been the subject of numerous applications and research projects. Usually, these make use of User-interaction mobile apps (Android, Flutter). Cloud services for backend and data storage, such as AWS and Firebase.

Security systems typically include remote monitoring and live video streaming. Typically, these solutions consist of IP cameras to record videos in real time. Video can be streamed to web or mobile interfaces using the RTSP/HTTP streaming protocols. Flutter plugins for streaming in apps, such as flutter\_vlc\_player.

Computer vision-based ML threat detection has grown in importance. Projects make use of computer vision for object and weapon detection. we have used YOLO model (You Only Look Once) for object detection. It does Real-time image processing using OpenCV and Deep Learning models. To identify dangers such as firearms, knives, or questionable conduct. models are trained for this. Our systems completely combine mobile interfaces, threat detection, and live surveillance. A few promising pieces Smart surveillance systems that use Firebase/Push notifications to alert users, stream video, and analyze threats. Using Firebase Cloud Messaging (FCM), users of mobile apps can receive alerts from backend AI models.

## III. EASE OF USE

The goal of the suggested Society Management App with Live CCTV Monitoring and Threat Detection is to create a unified system by combining cloud-based data management, real-time video surveillance, mobile technology, and artificial intelligence. The process starts with a Flutter-based mobile application that allows users, such as residents, society administrators, and security staff, to interact. This application serves as the main interface, giving residents the ability to control visitor entries, report incidents, and get immediate notifications. Administrators and security personnel can also view live CCTV feeds and effectively manage access control with the help of this application.

Live CCTV feeds are integrated into the Flutter app using RTSP-compatible plugins or WebView as needed. A Python-based YOLOv8 model is trained on surveillance datasets to detect potential threats (e.g., weapons, suspicious activities). The trained model is hosted on a Flask API server. CCTV frames are sent periodically to the API for inference. If a threat is detected, an alert is pushed to the admin/user. Firebase, which securely maintains user profiles, visitor records, and threat detection logs, supports the application's backend. This guarantees scalable storage, real-time data synchronization, and simple retrieval for administrative and investigative needs. The system seeks to improve community safety, offer quick incident response, and give residents a smart, well-organized living space by seamlessly combining AI-based threat detection, mobile app convenience, and a secure cloud database.

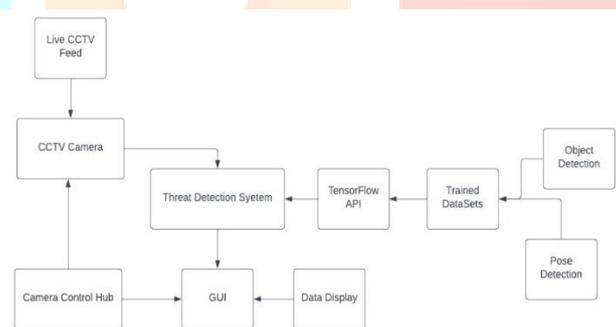


Fig. System Design

## IV. PROPOSED MODEL

The main goal of the suggested model is to create a smart society management system that incorporate AI powered threat detection and Realtime CCTV monitoring. The main user interface is a mobile application built with Flutter that enables interaction between the system and residents, society administrators, and security staff. While administrators and guards have access to live CCTV feeds and control mechanisms, residents can control visitor entries, report security concerns, and receive emergency alerts. By continuously streaming CCTV footage, the system integrates live surveillance. The YOLOv8 deep learning model analyzes the footage in real time. Threats like violent incidents, fire, illegal entry, and the presence of dangerous objects are all detected by YOLOv8.

The system automatically notifies the appropriate users via push notification when a threat is detected, allowing for prompt action. Firebase is used to securely manage all user data, visitor logs, and threat alerts, guaranteeing data protection, scalability, and real-time synchronization. To improve society administration, the application also incorporates permission-based access control and emergency broadcasting capabilities. By fusing AI-driven surveillance with effective mobile access and reliable cloud storage, the model seeks to develop a proactive, scalable, and secure society management solution that will provide a safer, more intelligent community living environment.

### 1. Layer of User Interaction:

Residents, society administrators, and security staff all use this layer as their main point of access. Users can engage with a number of features, including live CCTV monitoring, visitor management, emergency reporting, and real-time alert reception, via the Flutter-based mobile application. Role-specific access and functionalities are given to each user type, guaranteeing that residents have informational and reporting capabilities and security staff and administrators have control privileges.



Fig. System Architecture

## 2. Mobile Application Layer of Flutter:

The user interface and operational control centre are the Flutter-developed mobile application. It makes it easier to:

- watching live CCTV footage.
- Controlling access permissions and visitor entries.
- getting push notifications with threat alerts generated by AI.

reporting crises and incidents. The application guarantees a seamless user experience, secure, responsive communication with the backend services, and cross-platform compatibility (iOS and Android).

## 3. Live CCTV Monitoring and YOLOv8-Based Threat Detection Layer:

AI-powered real-time video surveillance is the system's central component. CCTV camera footage is continuously streamed and examined. For object detection and anomaly recognition, the YOLOv8 model (You Only Look Once, Version 8) is used. It can recognize threats like fire, physical violence, unauthorized intrusions, or hazardous objects. This layer ensures prompt notification to concerned users by immediately initiating an alert system upon detecting a threat.

## 4. Backend Database and Cloud Services Layer:

The backend system is built on Firebase, providing secure, real-time, and scalable data storage and synchronization. It manages:

- User authentication and profiles.
- Visitor logs and historical records.
- Storage of detected threat incidents and alert data.

### Database Dependencies

- Cloud firestore : ^5.6.6
- firebase AUTH : ^5.5.2
- firebase core: ^3.13.0
- firebase messaging: ^15.2.5
- firebase analytics: ^11.4.5
- onesignal\_flutter: ^5.1.2

Real-time push notifications. Firebase ensures the system remains synchronized, secure, and capable of handling large amounts of data efficiently, thus supporting both current operations and future scalability.

## V. RESULTS

The work presents a deep learning-based approach for real-time monitoring and threat detection. The project utilizes YOLOv8 models trained on diverse datasets, including 317 images and labels for fire detection, 1500 images and labels for gun detection, and 2000 images and labels for detecting fighting, robbery incidents within the surveillance.

This work significantly enhances security by offering an efficient and automated surveillance solution capable of proactively detecting potential threats. By integrating deep learning models, the system ensures accurate and rapid threat detection, thereby improving the overall security posture of society.

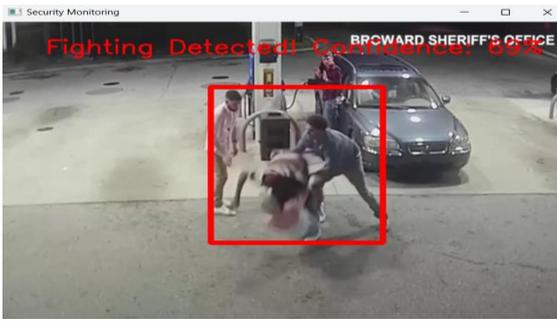


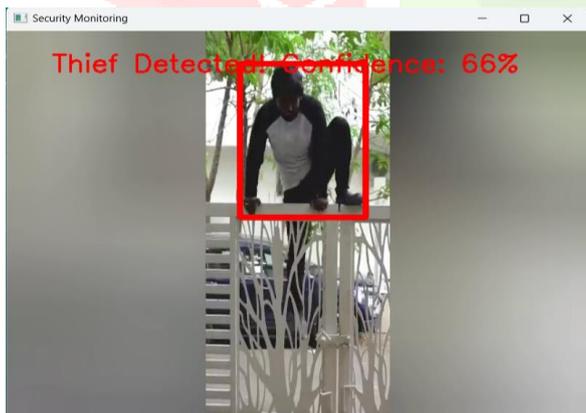
Fig 1. Fighting Detection



Fig 2. Fire Detection



Fig 3. Gun Detection



4 Thief Detection

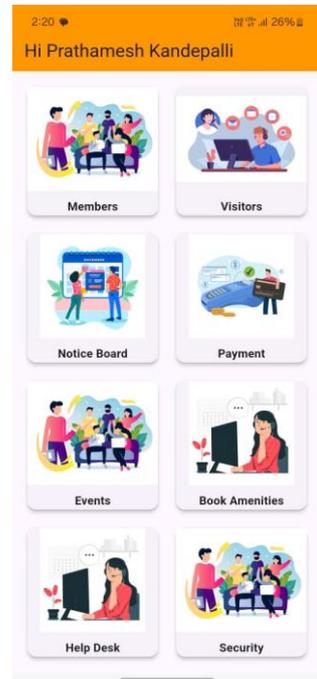


Fig 5. Home Screen



Fig 6. Member List

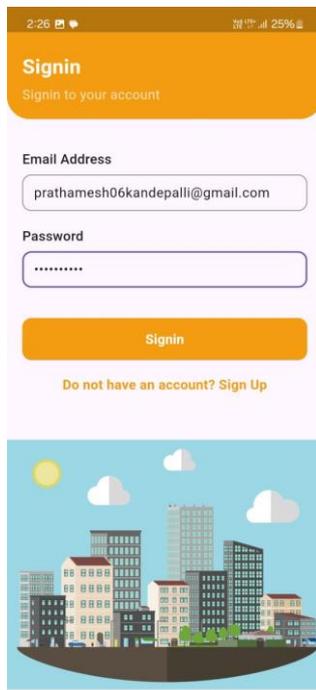


Fig 7. SignIn Screen

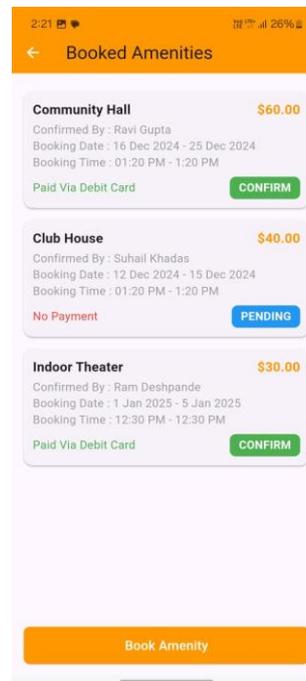


Fig 8. Notice Board

## VI. CONCLUSION

The Society Management Application with real-time CCTV monitoring and threat detection is a very apt solution to enhance the security of a residential society. Combining the IoT-based real-time CCTV with the advanced YOLOv8 deep learning algorithm for threat detection enhances surveillance and identifies threats in advance, particularly in potential fire, violence, robbery, or unwanted entry. This system offers point-of-sale notifications directly to society administrators via the Flutter app, hence being in a position to act on possible threats timely. Therefore, it has something to contend with, merging the best of cutting-edge technology and functional security protocols to reassure residents.

## VII. REFERENCE

- [1]. S. Raghavendra , Ramyashree , S. K. Abhilash , Venu Madhav Nookala , and S. Kaliraj (2023) . “Efficient Deep Learning Approach to Recognize Person Attributes by Using Hybrid Transformers for Surveillance Scenarios”.
- [2] Alruwaili, Madallah, Muhammad Nouman Atta, Muhammad Hameed Siddiqi, Abdullah Khan, Asfandyar Khan, Yousef Alhwaiti, and Saad Alanazi. "Deep Learning-Based YOLO Models for the Detection of People With Disabilities." IEEE Access (2023)
- [3]. Sohail, Muhammad, Ijaz Ali Shoukat, Haram Fatima, Mohsin Raza Jafri, Muhammad Azfar Yaqub, and Antonio Liotta. "Deep Learning Based Multi Pose Human Face Matching System." IEEE Access 12 (2024).
- [4]. Liu, Cheng-Jen, and Tsung-Nan Lin. "DET: Depth-enhanced tracker to mitigate severe occlusion and homogeneous appearance problems for indoor multiple-object tracking." IEEE Access 10 (2022): 8287-8304.
- [5]. Faisal Abdullah Ahmad Jalal.” Semantic Segmentation Based Crowd Tracking and Anomaly Detection via Neuro-fuzzy Classifier in Smart Surveillance System”.
- [6]. S. Chandrakala K. Deepak, G. Revathy.” Anomaly detection in surveillance videos: a thematic taxonomy of deep models, review and performance analysis”.
- [7] ASHISH SHARMA, NEERAJ VARSHNEY, Identification and Detection of Abnormal Human Activities using Deep Learning Techniques
- [8] Bolaji Omodunbi, Afeez Adekunle Soladoye, Adedayo Aladejobi Sobowale, Jesuferanmi Akinade, Development of a Real-Time Video-Based Threat Detection System using Convolutional Neural Network
- [9] Amit Manna, Sarvesh Washindkar, Nishil Rathod, Yash Gandhi, Vaishali Bodhale, Society Management App.

[10] Anand M, Anand M, Ananthu K, Basil P Sunny, Smita Unnikrishnant Professor(CSE)

Computer Science & Engineering, NCERC, Thrissur, India

[11] Benjamin W. Tatler Searching in CCTV: effects of organization in the multiplex

[12] Mayank Thacker a, Lay Shah b , Manan Shah: Society sync –Digitalize society management systems with artificial intelligence technologies *Branches Out*, 74-81.

[18]. Nallapati, R., Zhai, F., & Zhou, B. (2017). "SummaRuNNer: A Recurrent Neural Network Based Sequence Model for Extractive Summarization of Documents." *Proceedings of the Thirty-First AAAI Conference on Artificial Intelligence*, 3075-3081.

[19]. Erkan, G., & Radev, D. R. (2004). "Lex Rank: Graph-based Lexical Centrality as Saliency in Text Summarization." *Journal of Artificial Intelligence Research*, 22, 457-479.

