MINOR PROJECT REPORT

ON

SMART SURVEILLANCE SYSTEM FOR PUBLIC SAFETY USING DEEP LEARNING

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for the award of the degree of

BACHELOR OF TECHNOLOGY IN

COMPUTER SCIENCE AND ENGINEERING

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ABSTRACT

The increasing need for public safety in densely populated urban areas necessitates the development of advanced surveillance systems capable of real-time anomaly detection and response. This study presents a Smart Surveillance System for Public Safety, leveraging state-of-the-art deep learning techniques to identify and predict suspicious activities, such as violence, theft, and anomalous behavior. The system integrates Convolutional Neural Networks (CNNs) for spatial feature extraction and Recurrent Neural Networks (RNNs) for temporal sequence analysis, providing a comprehensive understanding of dynamic scenes. To enhance detection accuracy and computational efficiency, YOLOv4 (You Only Look Once, version 4) is employed as the primary object detection framework. YOLOv4 enables precise identification of entities in video streams, such as individuals and objects, while maintaining low latency—a critical requirement for real-time surveillance applications. The hybrid approach of combining CNNs and RNNs facilitates effective modeling of both static and temporal patterns associated with suspicious activities, improving the system's predictive capabilities. The proposed system is trained on diverse public datasets containing annotated instances of violent actions, theft scenarios, and unusual crowd behavior, ensuring robustness across various real-world contexts. Rigorous testing in simulated environments demonstrates its ability to achieve high detection accuracy, reduce false positives, and generate actionable alerts for law enforcement or security personnel. By providing an intelligent, automated solution for monitoring public spaces, the smart surveillance system aims to proactively mitigate risks, enhance situational awareness, and foster a safer environment for communities. Future work includes expanding the system's capabilities to incorporate audio analysis and multi-camera coordination, further augmenting its potential for large-scale deployment.

Keywords:

Smart surveillance system, public safety, deep learning, YOLOv4, anomaly detection, CNNs, RNNs, violence detection.