HUMAN ABNORMAL BEHAVIOR AND CRIME DETECTION FROM SURVEILLANCE VIDEOS IN A HOME ENVIRONMENT USING CNN AND RNN

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Thesis/Dissertation submitted in partial fulfillment of the requirement for the degree of Master of Science in Computer Science (Special) Data Science, Engineering and Analytics

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DECLARATION OF THE CANDIDATE & SUPERVISOR

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ACKNOWLEDGEMENT

I am grateful for the collective efforts of the entire faculty members of the Faculty of Engineering, University of Moratuwa, Sri Lanka to give this great opportunity to do this research project.

First and foremost, I would like to sincerely express my deep gratitude and immeasurable indebtedness to the Department of Computer Science and Engineering of the University of Moratuwa, Sri Lanka for providing this opportunity to me. I sincerely express my thanks to Professor Udayanga Hemapala, Dean of the Faculty and Eng. Professor Indika Perera Head of the Department, for giving this great chance to make it possible to do this research project.

I make this opportunity to thank my project supervisor Dr. Charith Chitranjan for supervising and guiding me to make my project a success. It has been a great pleasure and honour to work with my supervisor. His invaluable advice greatly helped me to drive this research work on the right track. And also, I wholeheartedly present my respectful thanking for all my research project panel members who gave pieces of advice.

Abstract

Currently, there are numerous reports and news articles concerning criminal incidents like theft, assault, and acts of terrorism. To uphold public safety and identify unlawful activities, surveillance mechanisms like surveillance cameras (CCTV) have been implemented in various public areas, including banks, institutes, stores, and subway stations. Nonetheless, it is unfeasible for a person to consistently and efficiently observe the cameras round the clock, throughout the entire week. Thanks to cutting-edge computer vision technology, the contemporary surveillance system not only serves as a substitute for human observation but also possesses the capability to autonomously and automatically conduct surveillance. The identification of unusual behavior plays a vital role in reducing the overall crime rate within society. By detecting abnormal behavior at an earlier stage, it becomes possible to prevent tragic events from occurring. In the realm of computer vision, deep learning has recently achieved significant success in the accurate detection of humans. In particular, Convolutional Neural Network (CNN) has been shown to have achieved a good performance in human detection [5]. Therefore, this literature review aims to analyze the methods of detecting abnormal behaviors from the videos of surveillance cameras using CNN. In addition, a method is proposed using CNN and RNN for classification of events as normal and abnormal as RNN can perform well to identify patterns. UCF dataset is chosen as it contain 13 types of abnormal events which can be considered as abnormal or violence event. No other dataset consist of videos of 13 types of crime that occurs in both day and night time. Here in this proposed method two pretrained models are chosen to ensemble after evaluating the performance of four pretrained model individually. And the proposed ensemble approach gives an accuracy of 77% to classify the events as normal and abnormal.

Keywords—Convolutional Neural Network, Abnormal behavior, Normal behavior, Object detection, Deep learning

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