FINAL YEAR PROJECT REPORT

ANOMALY DETECTION IN SURVEILLANCE VIDEOS

In fulfillment of the requirement
For degree of
BS (COMPUTER SCIENCES)

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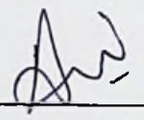
FALL-2022

DECLARATION

We hereby declare that this project report is based on our original work except for citations and quotations, which have been duly acknowledged. We also declare that it has not been previously and concurrently submitted for any other degree or award at Bahria University or other institutions.

Signature : 

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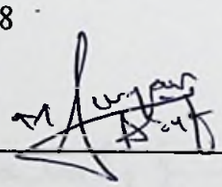
Signature : 

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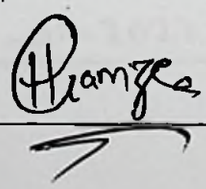
Signature : 

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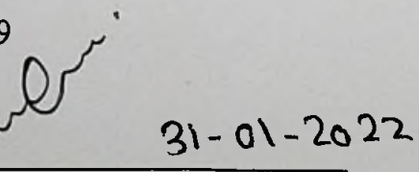
Date : 

ACKNOWLEDGEMENTS

We would like to thank everyone who had contributed to the successful completion of this project. We would like to express my gratitude to my research supervisor, Mr Bilal Muhammad Iqbal for his/her invaluable advice, guidance and his/her enormous patience throughout the development of the research.

In addition, we would also like to express my gratitude to our loving parent and friends who had helped and given me encouragement.

ANOMALY DETECTION IN SURVEILLANCE VIDEOS

ABSTRACT

Surveillance cameras are widely used in public areas e.g., streets, shopping malls, banks etc. to increase public safety. While the monitoring capability has not kept pace because of the rapid increase in surveillance cameras. So, there should be research done to address these difficulties. The objective of this project is to develop an anomaly detection system to automatically recognize the anomalous activities from surveillance cameras. This report explores different techniques used for anomalies detection. Different stages involving pre-processing stage, segmentation, and feature extraction will be studied and discussed. Finally, the end product of the algorithms will be written in the software called Jupiter Notebook. This project uses the Deep Neural Network approach. In our approach, we will have normal and anomalies videos as bags and video segments as instances in multiple instance learning (MIL), and by using 3D Convolutional architecture our model automatically learns an anomaly ranking model which predicts high anomalous scores for anomalous video segments, and we introduce sparsity and temporal smoothness constraints in the loss function to improve anomaly during training. The system first proceeds with the pre-processing of the data set by smoothing. Filtering, segmentation, and features extraction are also performed in the process. Our dataset consists of 1900 long and uncut real-world surveillance videos, having 13 different anomalies such as fighting, road accidents, etc. as well as normal videos. It can be useful for two tasks. First, general anomaly detection having all anomalies activities in one group and normal activities in another group. Second, for detecting each of 13 anomalous activities. This system is designed for making ease for the individual user as well as future development.

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