Suspicious Activity Detection

A Major Project Synopsis Submitted to

Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal

Towards Partial Fulfillment for the Award of

Bachelor of Technology
(Computer Science and Information Technology)

Under the Supervision of:-

Prof. Vandana kate Mam

Submitted By:-

Aman Sharma (0827CT191008)

Aniket Tiwari (0827CT191010)

Vidhi Sethiya (0827CT191063)

Department of Computer Science and Information Technology

Acropolis Institute of Technology & Research, Indore

Project Proposal:

Suspicious Activity Detection

Project Category:

Machine Learning/Artificial Intelligence/Algorithm Designing based.

Problem Statement:

Mischief or Fighting and Theft on College campuses is one of the most common and oldest criminal behaviors, and it is increasing day by day. Due to the increase in mischief, people have suffered fear and physical damage. As well as trained personnel to attain the desired security. These personnel, as human beings,make mistakes that might affect the level of security surveillance.

Scope:

Nowadays, Video Surveillance plays a pivotal role in today's world. The technologies have been advanced too much when artificial intelligence, machine learning and deep learning pitched into the system. Using above combinations, different systems are in place which helps to differentiate various suspicious behaviors from the live tracking of footages. The most unpredictable one is human behaviour and it is very difficult to find whether it is suspicious or normal. Deep learning approach is used to detect suspicious or normal activity in an academic environment, and which sends an alert message to the corresponding authority, in case of predicting a suspicious activity. Monitoring is often performed through consecutive frames which are extracted from the video. The entire framework is divided into two parts. In the first part, the features are computed from video frames and in second part, based on the obtained features classifier predict the class as suspicious or normal.

Specific Objectives:

1. The Objective is to detect Suspicious Activities in the Campus.
2. To detect People involved which are involved in Suspicious Activities
3. To reduce mischief or Suspicious Activities in Campus.
4. Real time notification to higher authorities with some evidences.

Stake Holders of Project:

Colleges, Government Bodies, Hospitals,Courts, Gardens, Schools, Coaching etc.

Advantages:-

1. Avoid Suspicious Activities in the Campus...

2. Reduces number of mischief in campus.

3.Fully automated (No person is required to operate).

5. Installation cost is very affordable while considering the effectiveness of the project.

Background:

In 2019, the percentage of students in Higher grades who reported having been in a physical fight anywhere during the previous 12 months was about 22 percent overall, ranging from 17 percent in Hawaii, Iowa, and Maine to 29 percent in the District of Columbia.[2,3] The percentage who reported having been in a physical fight on school property during the previous 12 months was 8 percent overall, and it ranged from 6 percent in Maine, Kentucky, South Dakota, and Massachusetts to 15 percent in California.[4] Overall, the percentage of students in grades Higher who reported having been in a physical fight anywhere during the previous 12 months was lower in 2019 than in 2009 (22 vs. 31 percent), and the percentage of students who reported having been in a physical fight on school property was also lower in 2019 than in 2009 (8 vs. 11 percent).

In every survey year from 2009 to 2019, a higher percentage of male students than of female students in grades Higher reported having been in a physical fight during the previous 12 months, both anywhere and on school property. In 2019, for example, 28 percent of male students, compared with 15 percent of female students, reported having been in a physical fight anywhere; 11 percent of male students, compared with 4 percent of female students, reported having been in a physical fight on school property.

Similar to the pattern for students overall, the percentages of both male and female students in grades Higher who reported having been in a physical fight, both anywhere and on school property, during the previous 12 months were lower in 2019 than in 2009. For example, 11 percent of male students reported having been in a physical fight on school property in 2019, compared with 15 percent in 2009; similarly, 4 percent of female students reported having been in a physical fight on school property in 2019, compared with 7 percent in 2009.

Whether the Implementation and deployment of the project idea (yes/no)

a) Has Social benefits.

YES

b) Has Environmental Benefits

NO

c) Considers health, safety, legal and cultural issues

YES

d) Considers sustainable development (economic development that is conducted without depletion of natural resources)

YES

e) Applies ethical principles while selecting project (not to steal other's project idea, code and documents)

YES

f) Commits to professional ethics and responsibilities and norms of the engineering practice.

YES

g) Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools .

YES

h) Identify, formulate, review research literature, and analyze engineering problems reaching substantiated conclusions.

YES

Technological know-how required for proposed project idea:

In this Project we are using CNN from Deep Learning/Machine Learning.

Proposed Timetable:

	Description of Work	**Expected no. of weeks to complete the module**
Module One	Exploring idea and literature review	2 week
Module Two	Research on technology and hardware	2 week
Module Three	Synopsis and presentation	1 week
Module Four	Learning technology	5 week
Module Five	First module implementation: (30% project)	8 week

Module Six	Second , Third module implementation and integration, testing and maintenance	20 weeks (6th semester)

Project Benefits:

University campus and academic institutions Video surveillance is being used in university campuses and other academic institutions to monitor the activities of students for the safety of assets from theft and vandalism. It also helps to prevent the inappropriate behavior of the students and fighting among the students. It also monitors the perimeter of the university campus, school and academic institutions for the safety of the students and faculties. Video surveillance can be used at the time of examination to monitor the suspicious activity of the students in the examination hall.

References:

[1] Joey Tianyi Zhou, Jiawei Du, Hongyuan Zhu, Xi Peng, Rick Siow Mong Goh, ”AnomalyNet: An Anomaly Detection Network for Video Surveillance, 2019.

[2] Monika D. Rokade and Tejashri S. Bora, "Survey On Anomaly Detection for Video Surveillance" 2021 International Research Journal of Engineering and Technology(IRJET).

[3] Jefferson Ryan Medel, Andreas Savakis, “Anomaly Detection in Video Using Predictive Convolutional Long Short-Term Memory Networks” under review.

[4] W. Luo, W. Liu, and S. Gao, “A revisit of sparse coding based anomaly detection in stacked rnn framework,” in
The IEEE International Conference on Computer Vision (ICCV), Oct 2017

[5] Y. S. Chong and Y. H. Tay, “Abnormal event detection in videos using spatiotemporal autoencoder,” in International Symposium on Neural Networks. Springer, 2017, pp. 189–196