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WEAPON DETECTION

[1] P. Deekshitha, [2] P. Nikhilesh, [3] K.Sai Charith, [4] Aniroodh Reddy, [5] P. Swetha
B. tech student, B.tech student, B.tech student, B.tech student, Assistant Proffesor
DEPARTMENT OF CSE
VIDYA JYOTHI INSTITUTE OF TECHNOLOGY, AZIZ NAGAR, HYDERABAD.

Abstract : This study has been undertaken to detect the important features without any human supervision. For example, given many pictures of cats and dogs it learns distinctive features for each class by itself. Here, CNN is computationally efficient. In this article, we propose an implementation of traffic signs recognition algorithm using CNN. Weapon detection using deep learning have shown promising results in detecting firearms and other dangerous objects in surveillance images. These systems have the potential to improve public safety by providing real time alerts to law enforcement agencies in situations where weapons are present.

Keywords - Computational Neural Network, deep learning, firearms, weapons.

I. INTRODUCTION

Weapon detection is the identification of irregular, unexpected, unpredictable, unusual events or items which is not considered as a normally occurring event or a regular item in a pattern or items present in a dataset and thus different from existing patterns. An anomaly is a pattern that occurs differently from a set of standard patterns. Object detection uses feature extraction and learning algorithms or models to recognize instances of various category of objects.

Proposed implementation focuses on accurate various detection and classification of guns. Choosing the right approach required to make a proper trade-off between accuracy and speed.
Fig1 shows the methodology and implementation of weapons detection using deep learning.

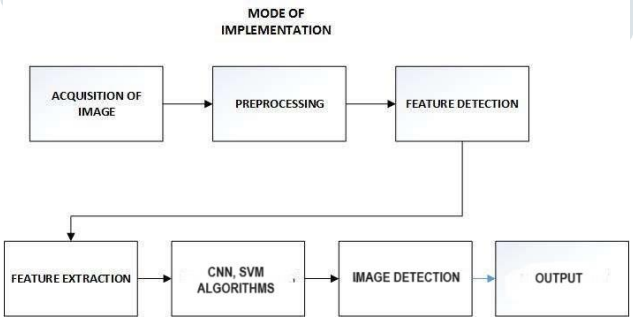

Fig:1 Methodology

The primary goal is to improve security by implementing an automated weapon detection that can quickly and accurately identify potential threats in real time. Ensuring compatibility and integration with existing security infrastructure, such as surveillance and monitoring systems to create a comprehensive security network.
Designing a a system that can be easily scaled to accommodate different environments and sizes ranging from small-scale installations to larger public spaces.

SYSTEM ARCHITECTURE

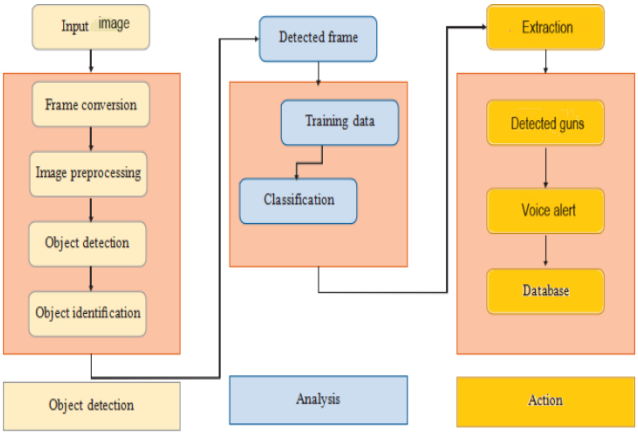

Fig:2 System architecture

II. SYSTEM ANALYSIS AND EXISTING SYSTEM

Weapon detection is the identification of unusual, unpredictable events or items which is not considered as a normally occurring or event or a regular item in a pattern or items present in a dataset and thus different from existing patterns.

An anomaly is a pattern that occurs differently from a set of standard patterns. Therefore, anomalies depend on the phenomenonof interest. Object detection uses feature extraction and learning algorithms or models to recognize instances of various categoryof objects.

III. PROPOSED SYSTEM

Proposed system focuses on accurate gun detection and classification. Also concerned with accuracy, since a false voice notein adverse response. Choosing the right approach required to make a proper trade-off between accuracy and speed.

In object recognition applications, the used deep learning algorithm is the CNN algorithm. This algorithm shows outstanding success in the ImageNet Large-Scale Visual Recognition Competition held in 2012 and has been used in the development of new models in many areas since then. The old model consists of a total of 25 layers (convolution (n=7), pooling (n=4).

IV. IMPLEMENTATION MODULE DESCRIPTION

CNN: A Convolutional Neural Network (CNN) is a type of Deep Learning neural network architecture commonly used in Computer vision. Computer vision is a field of Artificial Intelligence that enables a computer to understand and interpret the image or visual data.

When it comes to Machine Learning, Artificial Neural Network performs really well. Neural Networks are used in various datasets like images, audio and texts.

SVM: Support Vector Machine (SVM) is a supervised machine learning algorithm used for both classifications and regression. Though we say regression problems as well it's best suited for classification. The main objective of the SVM algorithm is to find the optimal hyperplane in an N-dimensional space that can separate the data points different classes in the feature space.

V. RESULTS AND DISCUSSION

Steps to apply CNN and SVM algorithms while weapons detection.

1. 'Upload Kaggle Dataset' to upload the dataset.
2. Dataset folder to load the dataset.
3. Running SVM algorithm we get confusion matrix and accuracy for SVM.

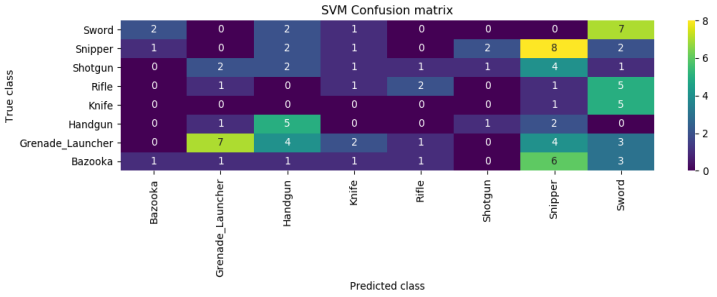

Fig:3 SVM confusion matrix

4. 'Extract texture and GLCM features' to extract features.
5. Running CNN algorithm we get confusion matrix and accuracy for CNN.

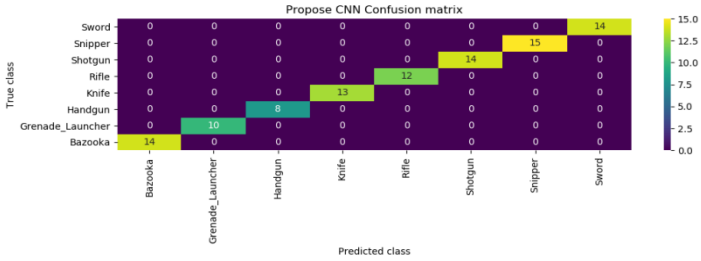

Fig:4 CNN confusion matrix

OUTPUT:

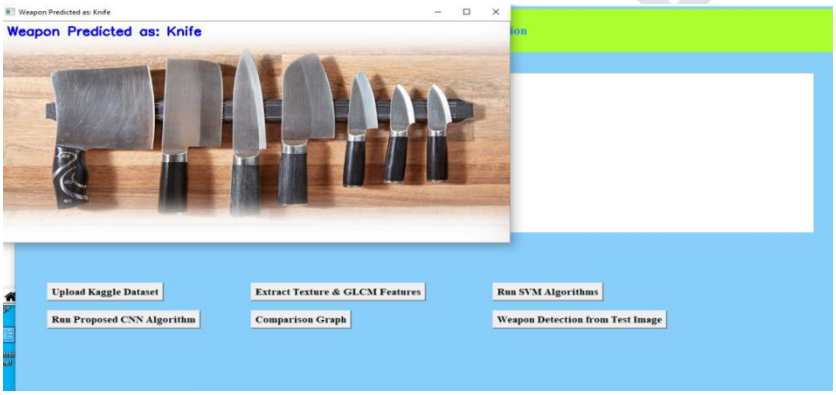

Fig:5 Weapon detection form test image

VI. CONCLUSION

Weapon detection systems using deep learning have shown promising results in detecting firearms and other dangerous objects in surveillance images. These systems have the potential to improve public safety by providing real time voice notes
in situations where weapons are present.
However, there are still challenges to be addressed such as the need for large scale training data, the potential for falsepositives and negatives and the ethical considerations surrounding the use of these systems.
Further research and development are needed to improve the accuracy and reliability of weapon detection system and to ensure their responsible deployment in real world settings.

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