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UNIQUE WEAPON DETECTION SYSTEM PROMOTING SECURE CITY WITH AUTO ALERT SYSTEM

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Abstract: Crime is a deed that is based on an offensive act, but to overcome such offensive acts it has always been necessary to utilize different means to minimize them in short time. Some of these crimes result in danger to both the environment and human life. Every country in the world seeks peace because it enables societies to flourish, and economies to grow and achieve new heights of success over time. Contrary to this, an unpeaceful environment full of illegal activities brings the downfall of societies, communities, and countries.A mobile application will be developed using react js for notification on weapon detection. Thus, this project helps in effective prediction of detect the weapon at public places in real time applications

Keywords: mobile application, weapon

I. INTRODUCTION

Weapon detection with AI and deep learning technologies is used for security applications. Such vision-based systems can recognize and interpret scenes using the footage of video surveillance systems. AI vision methods are used to recognize knives and guns with the goal to reduce crimes and increase safety and security. In traditional video surveillance, security agents have to visually detect the presence of weapons in monitored scenes by watching security footage and quickly make decisions based on it. One of the most effective solutions to overcome the shortcomings of manual analysis is to process the real-time video stream of surveillance cameras with deep learning algorithms to automate weapon detection at higher accuracy.

A. Objective

- To apply object detection algorithm to determine the weapon detection.
- To provide an effective solution for predict the weapon detection.
- To develop a mobile application for notification sent to owner when a weapon is detected

II. RELATED WORK

PAPER I: It showed that the proposed VD-Net was more effective for its deployment in industrial surveillance systems It is not good at capturing spatial correlation over a large spatial extent

PAPER II: After training with Yolov7-tiny algorithm, it will validate and evaluate the datasets.Validation in deep learning is like a authorization or authentication of the prediction done by a trained model. While on the other hand, evaluation in deep learning refers to assessment or test of entire deep learning model and its performance in various circumstances.It involves assessment of deep learning model training process, deep learning algorithms performance and how accurate is the predictions given in different situations.

PAPER III: The main purpose of this research work is to find the best prediction model i.e., the best Deep Learning techniques which will determine the weapon detection in CCTV camera surveillance videos. After applying with deep leaning algorithm, when an input image is given for prediction process, it can easily determine the weapon detection via CCTV camera. Thus, this project helps in effective prediction of detect the weapon at public places in real time applications.

PAPER IV: The use of domain knowledge can reduce the complexity of problems to be solved, which is one of the main reasons for the popularity of heuristics. The quality of solutions generated by RS is unstable and decreases with problem size.

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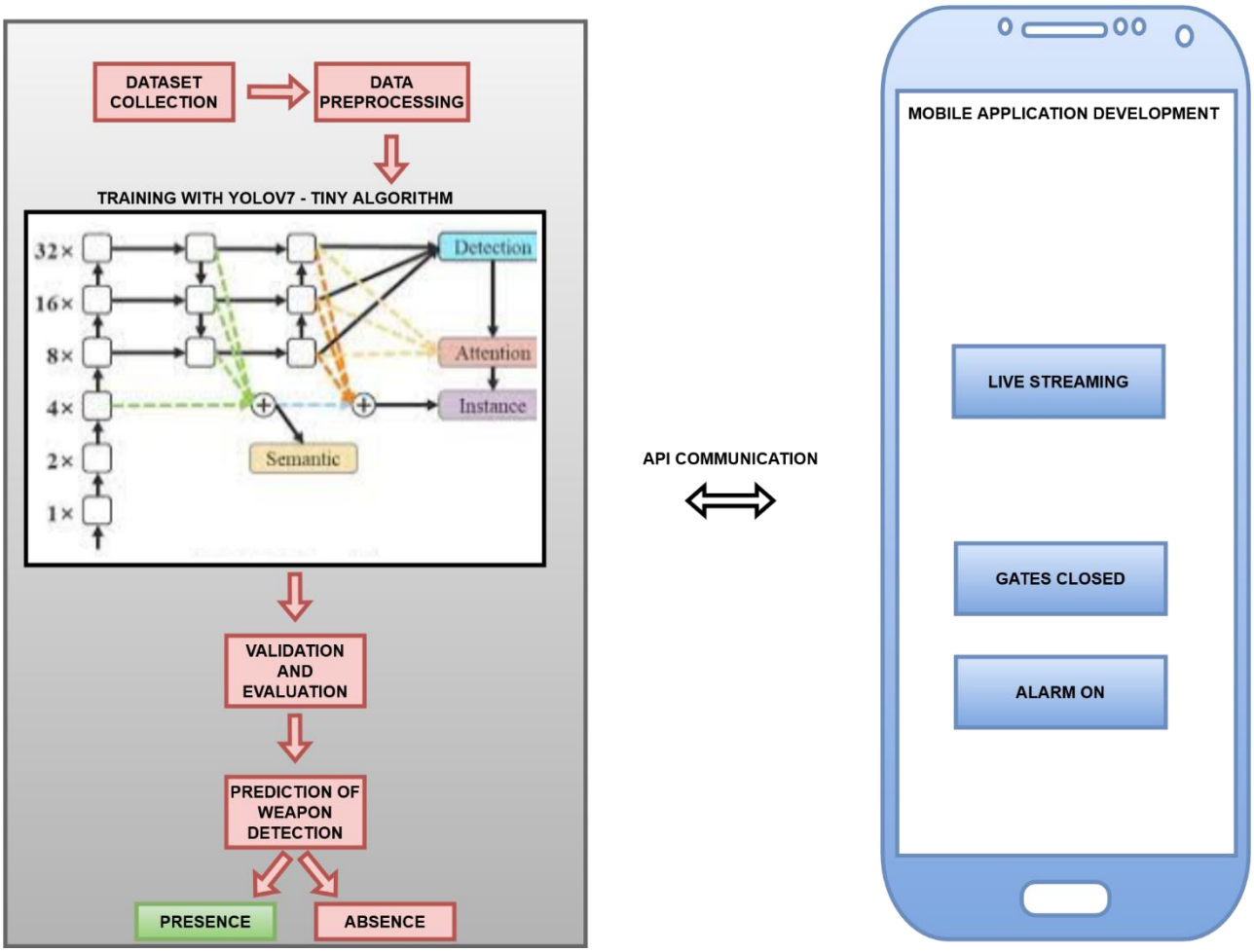
III. SYSTEM ARCHITECTURE



IV. IMPLEMENTATION

A. Dataset Collection

Scraping from The Web. Manually finding and downloading images from internet with huge amount of work involved.Third-party. Since data has become such a valuable commodity in the deep learning era, many start-ups have started to offer their own image annotation services. Those are called as third party datasets Pre-trained Networks In this process, a network pre-trained on a large datasets are collected from internet resources. In this project, we will be collect the datasets from Sohas Weapon Dataset.

B. Dataset Preprocessing

Data preprocessing is a process of preparing the raw data and making it suitable for a machine learning model. It is the first and crucial step while creating a machine learning model.When creating a machine learning project, it is not always a case that we come across the clean and formatted data. And while doing any operation with data, it is mandatory to clean it and put in a formatted way. So for this, we use data preprocessing task.A real-world data generally contains noises, missing values, and maybe in an unusable format which cannot be directly used for machine learning models.

C. TRAINING WITH DEEP LEARNING ALGORITHM

After dataset collected and preprocessing, it will be fed for training with the deep learning algorithm such as Yolov7-tiny.The YOLOv7 algorithm is making big waves in the computer vision and machine learning communities.YOLOv7 is the fastest and most accurate real-time object detection model for computer vision tasks. The official YOLOv7 paper named “YOLOv7: Trainable bag-of-freebies sets new state-of-the-art for real-time object detectors” was released in July 2022 by Chien-Yao Wang, Alexey Bochkovskiy, and Hong-Yuan Mark Liao. The YOLOv7 research paper has become immensely popular in a matter of days.

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V. CONCLUSION

This paper talks about the application of YOLOv7 tiny as a weapon detection model that can be used in various public places in order to enforce security.

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