

VASANTDADA PATIL PRATISTHAN COLLEGE OF ENGINEERING

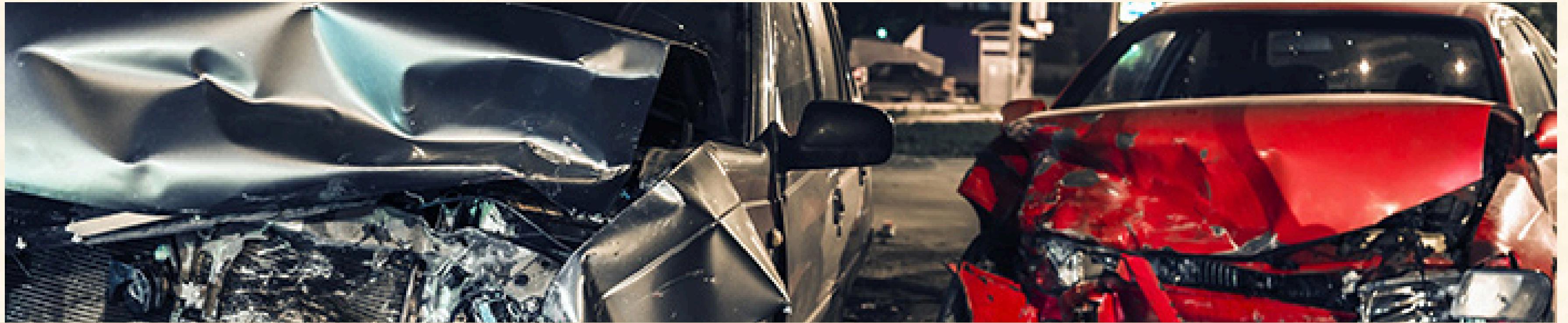
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TOPIC

REAL TIME OBJECT DETECTION AND TRACKING FOR VIDEO
SURVEILLIANCE USING DEEP LEARNING

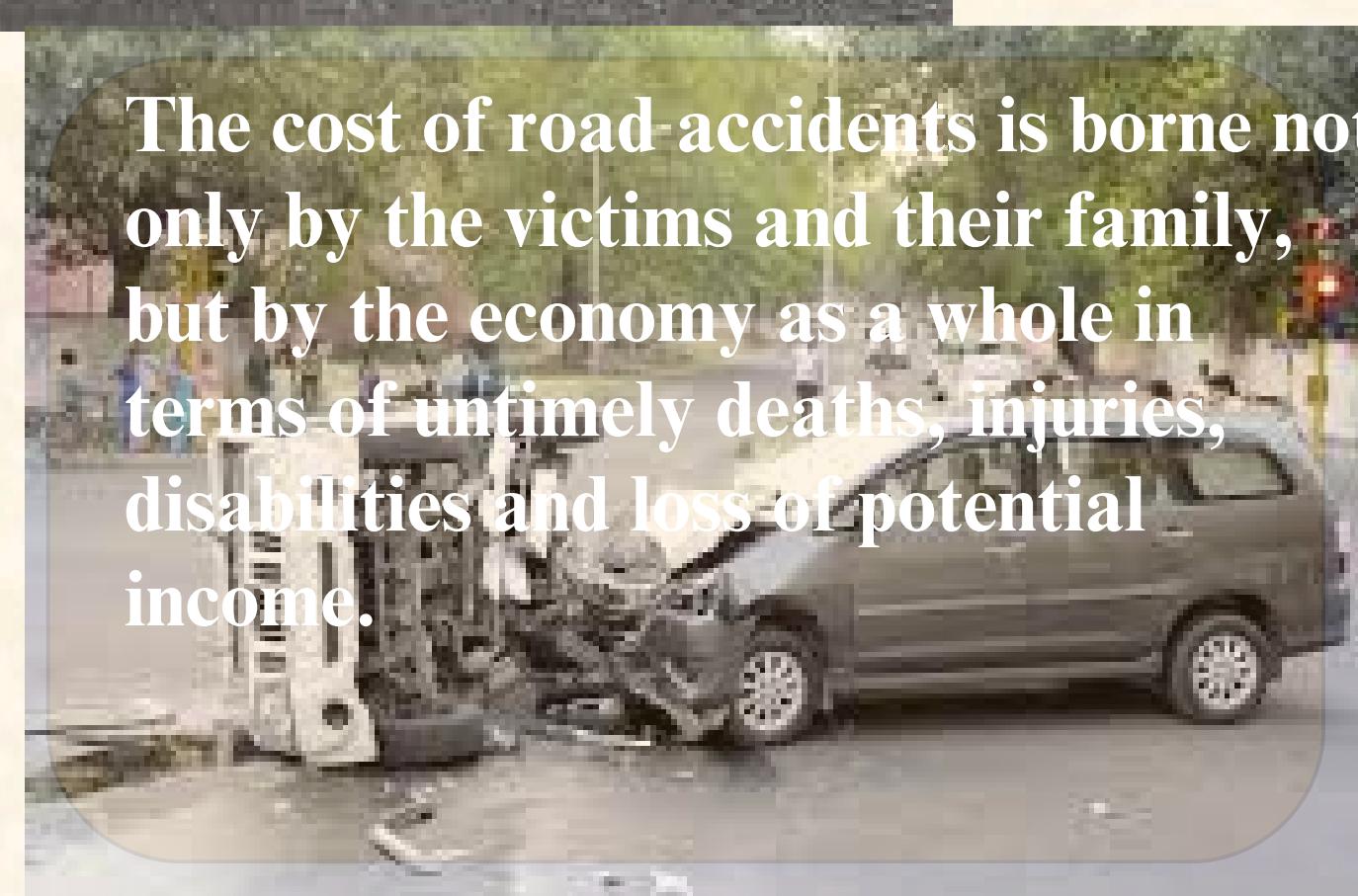
CONTENT

- Introduction
- Objective
- Literature survey
- Design and Methodologies
- Implementation
- Standards
- Future scopes
- Conclusion

OVERVIEW

Road safety continues to be a major developmental issue, a public health concern and a leading cause of death and injury across the world. At least one out of 10 people killed on roads across the world is from India, according to the World Health Organization.

Unfortunately, the worst affected age group in Road accidents is 18-45 years, which accounts for about 67 percent of total accidental deaths.



It is indeed a matter of great concern that despite the continuing efforts of the Government in this regard and our commitments for halving fatalities we have not been able to register significant progress on this front.

During the year 2021, a total number of 4,12,432 road accidents have been reported in the country, claiming 1,53,972 lives and causing injuries to 3,84,448 persons.

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- This proposed method can help in accident detection and reporting it.
- Once the accident is detected by the DL module, all the closest emergency services such as the hospital, police station, mechanics, etc., are notified.
- Ensemble transfer learning with dynamic weights is used to minimize the false detection rate. With this prospect, using Convolutional Neural Network of Deep Learning method along with python programming language and other necessary tools, it is possible to accurately locate the scene of an accident and report it quickly to emergency services.

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Ensemble transfer learning with dynamic weights is used to minimize the false detection rate.

In prospect, using Convolutional Neural Network of Deep Learning along with python programming language and other necessary tools, it is to accurately locate the scene of an accident and report it quickly to emergency services.



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<u>NO.</u>	<u>TITLE</u>	<u>OVERVIEW</u>	<u>OBJECTIVE</u>	<u>CONCLUSION</u>
1	Accident Detection using Convolutional Neural Networks	The intent here was to create a system which would detect an accident based on the live feed of video from a CCTV camera installed on a highway. The idea is to take each frame of a video and run it through a deep learning convolution neural network model	In this system, it have a Raspberry Pi 3 B+ Model which acts as a portable and remote computer to be set up on a CCTV camera. For demonstration purposes, it will be using a Pi Camera which can be directly set up on a Raspberry Pi. It's pre-trained an Inception v3 model to be able to detect accidents by training it on two different sets of images and sequence of video frames.	Unlike other systems in use, which consists of expensive sensors and unwanted hardware, the proposed system is much more cost effective and foolproof with a much-improved accuracy rate than its counterparts mainly due to a model-based approach

2

Vision-based real-time traffic accident detection

We intend to extract foreground and background from video shots using the Gaussian Mixture Model to detect vehicles; afterwards, the detected vehicles are tracked based on the mean shift algorithm.

The proposed approach is divided into three procedures, which include vehicle detection, tracking and parameters extraction. Gaussian Mixture Model is used to capture the moving vehicles, and then the detected vehicles are tracked in mean shift algorithm.

Performed experiments confirm the efficiency and effectiveness of the proposed approach, and demonstrate that it can detect real-time traffic accidents automatically.

3

Camera-based Smart Traffic State Detection in India using Deep Learning Models

This builds an intelligent traffic monitoring system using state-of-the-art deep learning models that aims to detect traffic accidents, burning vehicles, and traffic state (congestion/sparse traffic) using a single model for real-time monitoring purpose.

It adopts on two techniques. First, it uses transfer learning approach to fine-tune pre-trained state-of-the-art deep learning models on the traffic dataset, which handles small scale dataset. Secondly, it uses web-crawling (using Bing Image Search API) to build a custom dataset containing Indian images that can be used to extend the usability of the model to detecting traffic accidents.

This study presents a method to detect four different kinds of traffic situations namely dense traffic, sparse traffic, road accidents, and burning vehicles using a single unified model based on the state-of-the-art deep learning models for Indian traffic conditions.

4	Convolutional Neural Network (CNN) for Image Detection and Recognition	<p>Deep Learning algorithms are designed in such a way that they mimic the function of the human cerebral cortex. These algorithms are representations of deep neural networks i.e. neural networks with many hidden layers.</p>	<p>In this project, CNN models are built to evaluate its performance on image recognition and detection datasets. The algorithm is implemented on MNIST and CIFAR-10 dataset and its performance are evaluated.</p>	<p>The accuracy of models on MNIST is 99.6 %, CIFAR-10 is using real-time data augmentation and dropout on CPU unit.</p>
5	A Survey of Convolutional Neural Networks: Analysis, Applications, and Prospects	<p>First, this review introduces the history of CNN. Second, it provide an overview of various convolutions. Third, some classic and advanced CNN models are introduced; especially those key points making them reach state-of-the-art results.</p>	<p>In detail, the key contributions of this review are as follows: 1) It provide an overview of some inspiring convolutions, including basic building blocks of modern CNN, deformable convolution, group convolution, steerable convolution.</p>	<p>Due to the advantages of CNNs, such as local connection, weight sharing, and down sampling dimensionality reduction, CNN has been widely deployed in both research and industry projects. Moreover, there are lots of problems that convolution is hard to handle, such as low generalization ability, lack of equivariance, and poor crowded-scene results.</p>

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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 deep learning model.

Training Model : A training model is a dataset that is used to train an DL algorithm. It consists of the sample output data and the corresponding sets of input data that have an influence on the output. The training model is used to run the input data through the algorithm to correlate the processed output against the sample output.



Reporting System : If the model detects an accident then, the reporting module will send a SMS notification to the emergency service.

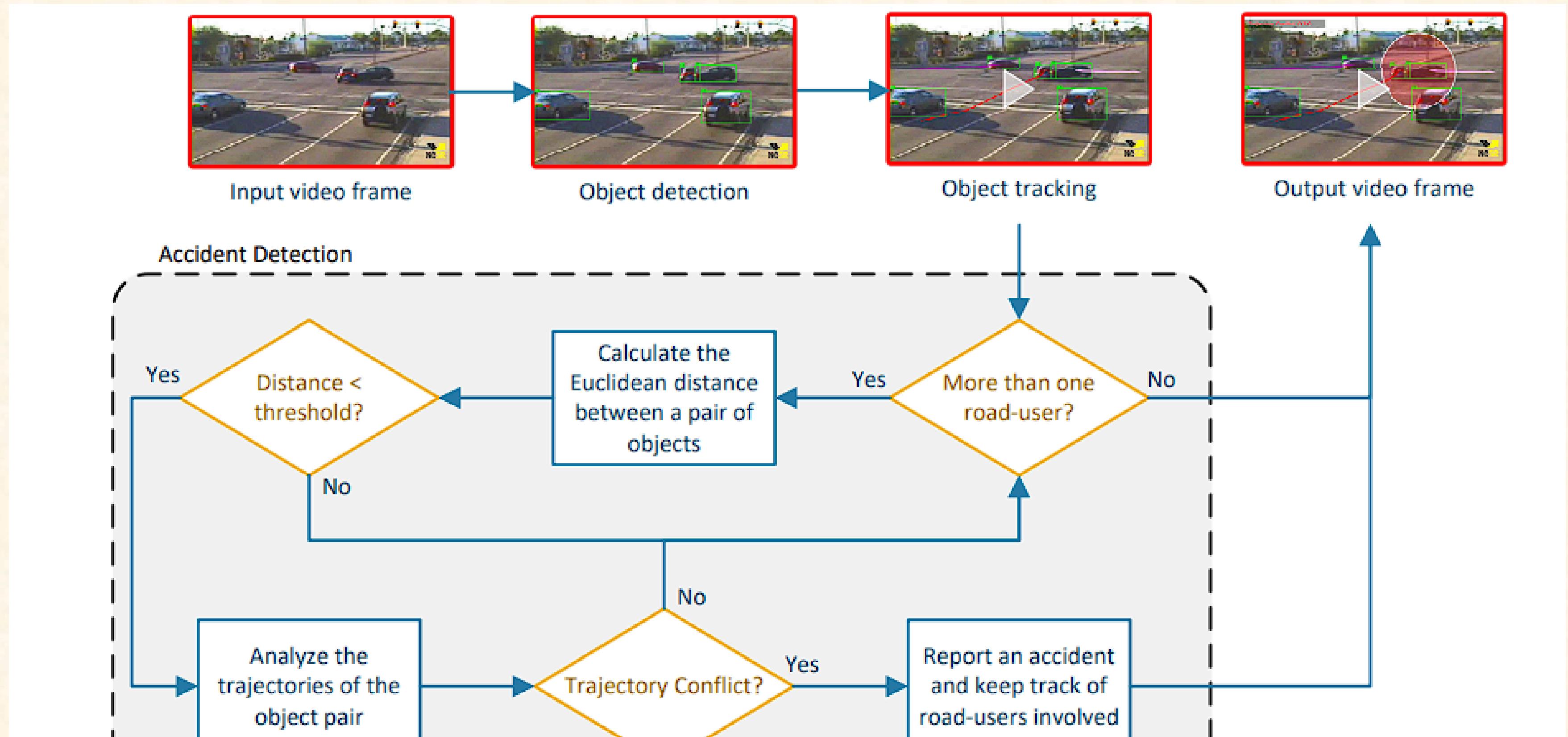
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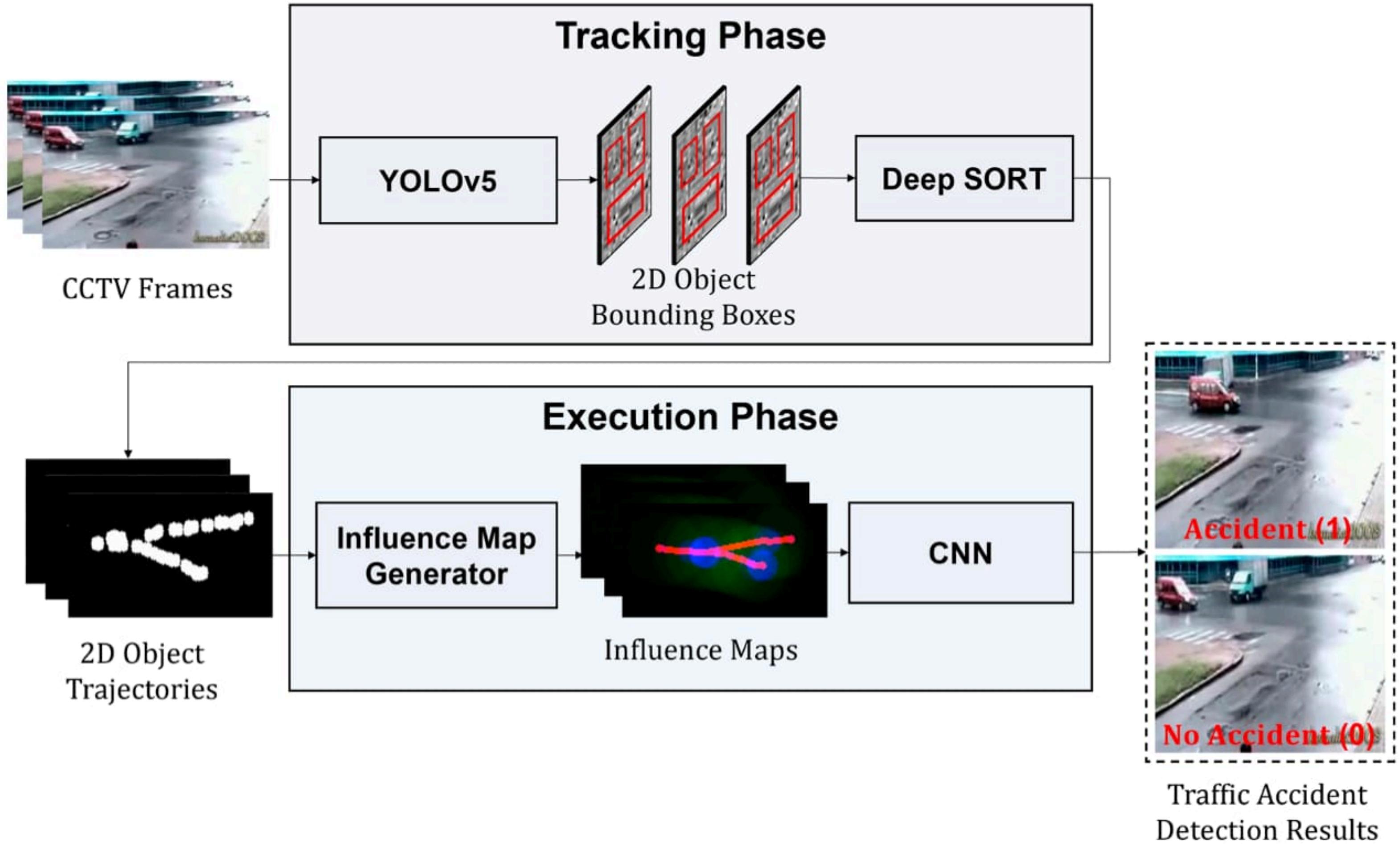
ARCHITECTURE DIAGRAM

- An architectural diagram is a visual representation that maps out the physical implementation for components of a software system.
- It shows the general structure of the software system and the associations, limitations, and boundaries between each element.



WORKING





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Geopy:

Geopy is a Python client for several popular geocoding web services.

Geopy makes it easy for Python developers to locate the coordinates of addresses, cities, countries, and landmarks across the globe using third-party geocoders and other data sources.

Numpy:

NumPy is a Python library used for working with arrays. It also has functions for working in domain of linear algebra, fourier transform, and matrices

Panda :

Pandas is a Python library used for working with data sets.

It has functions for analyzing, cleaning, exploring, and manipulating data.

Pandas allows us to analyze big data and make conclusions based on statistical theories.

Pandas can clean messy data sets, and make them readable and relevant.

Relevant data is very important in data science.

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colab.research.google.com/drive/1q_hmo1GpHyLIV94e8aRASHNnOcV62IAe#scrollTo=wKgQ_gLUiAkt

VOB Attempts & C... SAP Fieldglass Login Time OFF Form | C... Bliss 2.0 SPINE HR Uber

Final Project

File Edit View Insert Runtime Tools Help All changes saved

+ Code + Text

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print("Accident")
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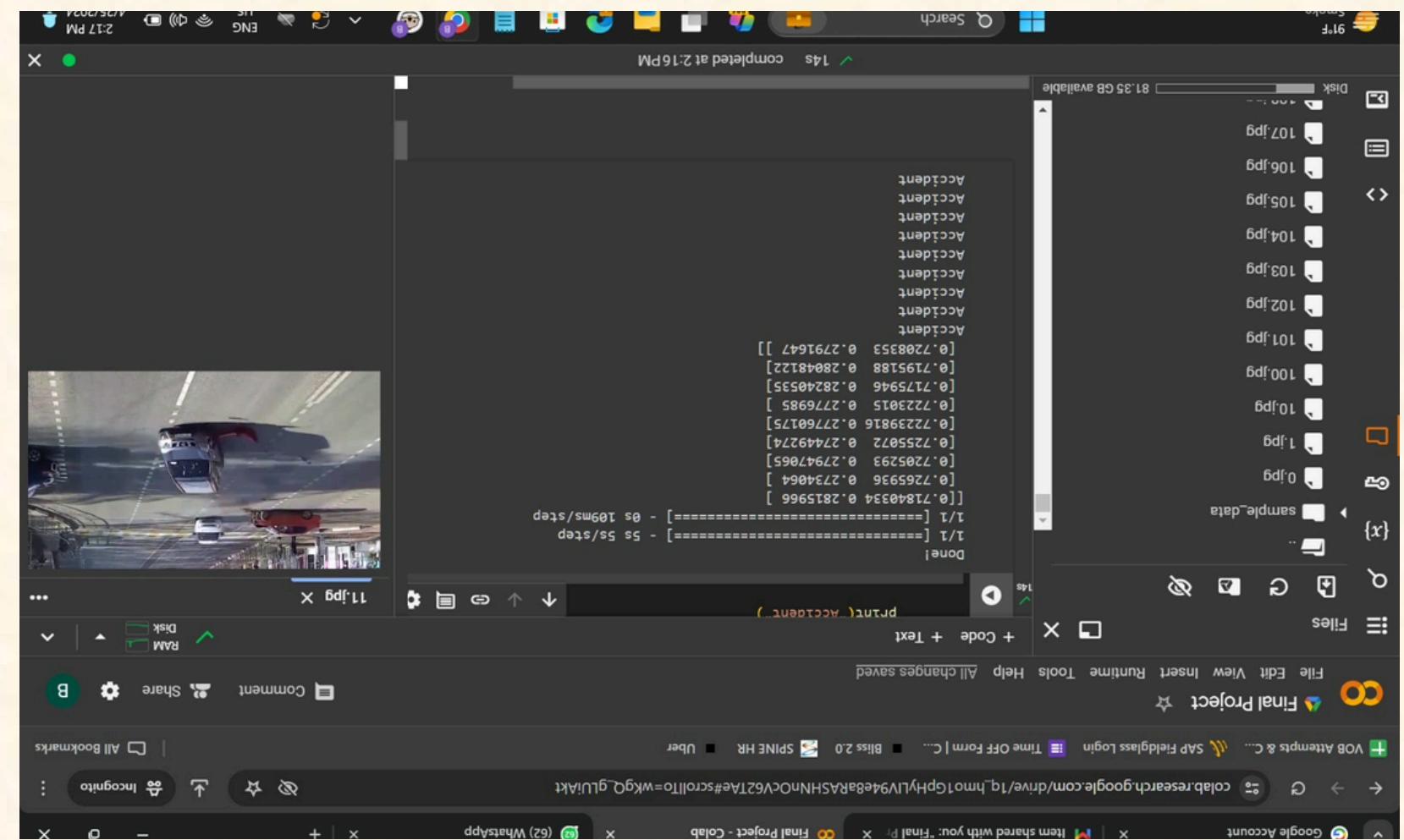
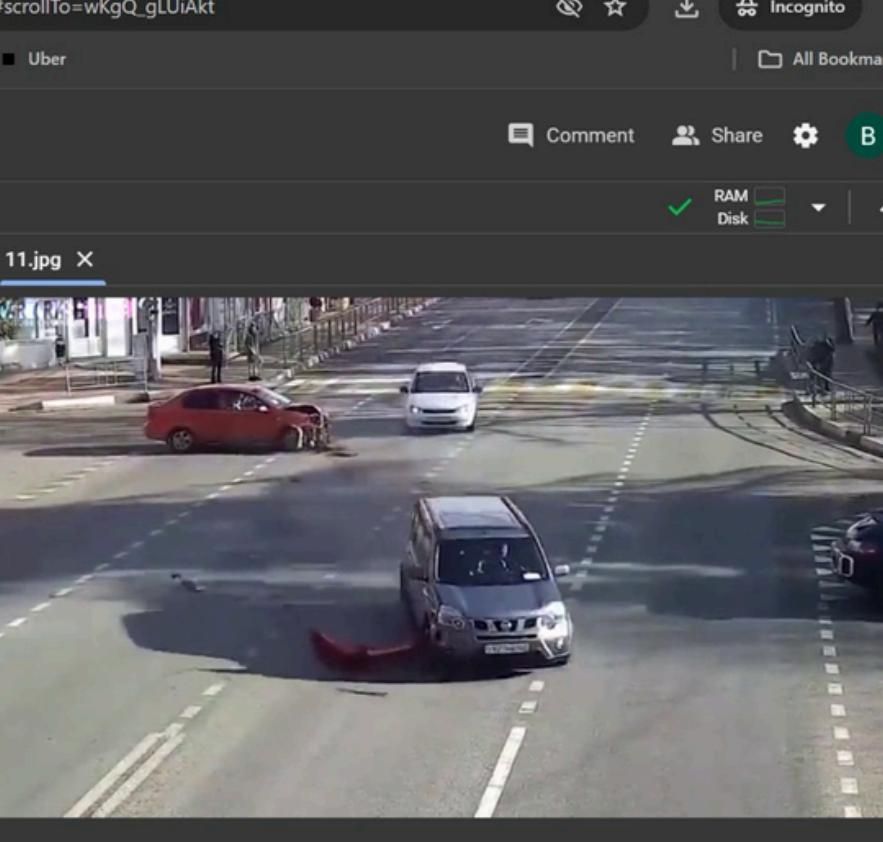
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Files

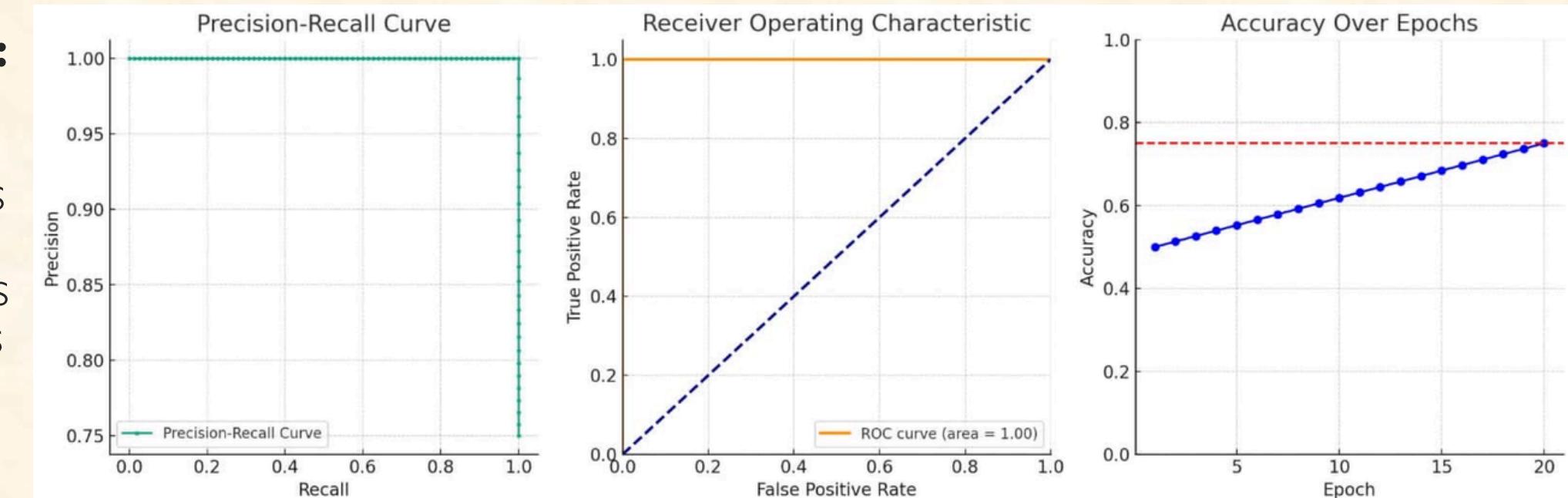
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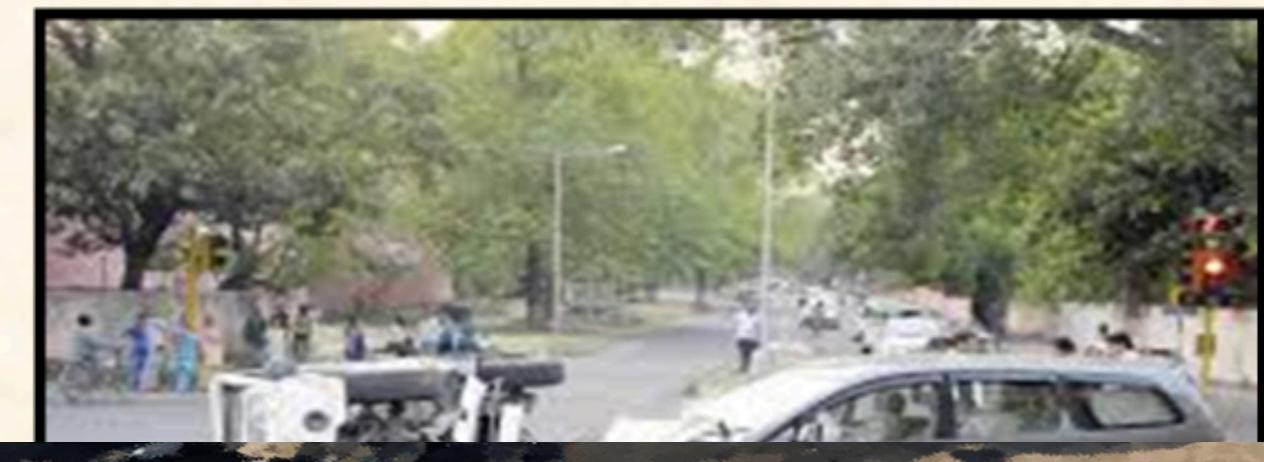
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- **1. Precision-Recall Curve:** - The leftmost graph plots precision against recall. - The graph shows an almost perfect precision across all recall levels, which might suggest overfitting or data imbalance.
- **2. Receiver Operating Characteristic (ROC) Curve:** - The middle graph plots the true positive rate against the false positive rate. - The ROC curve has an area under the curve (AUC) of 1.00, indicating perfect classification, which is highly unusual and might suggest overfitting or data issues.
- **3. Accuracy Over Epochs:** - The rightmost graph shows accuracy changes over training epochs. - Accuracy increases with each epoch, showing learning progress, but potential overfitting is not clear from the graph alone.



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- Our project for accident detection using CNN Algorithm, detection using deep learning python programming and reporting system by sending SMS.
- This project presents vehicle accident detection and alert system with SMS to the user defined mobile numbers .The object tracking, detection is designed and implemented. The proposed vehicle accident detection can track geographical information automatically and sends an alert SMS regarding accident.
- The system is successfully studied and is implemented after studying in detail, it is observed that this system is efficient and reliable.



THANK YOU