

MES COLLEGE OF ENGINEERING, KUTTIPPURAM  
DEPARTMENT OF COMPUTER APPLICATIONS  
20MCA246 – MAIN PROJECT

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PRO FORMA FOR THE APPROVAL OF THE FOURTH SEMESTER MAIN PROJECT

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*(Note: All entries of the pro forma for approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)*

Main Project Proposal No : ____1____ _____	Academic Year : 2021- 22 Year of Admission : 2020
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1. Title of the Project : **VEHICLE SEARCHING WITH DEEP LEARNING**

2. Name of the Guide : FEBIN AZIZ

3. Student Details (in BLOCK LETTERS)

Name	Register Number	Signature
<u>SURFA FARSEENA</u>	<u>MES20MCA-2054</u>	_____

Date:

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**Approval Status :**    Approved / Not Approved

Signature of  
Committee Members }

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**Comments of the Guide**

Dated Signature

Initial Submission :

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First Review :

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Second Review :

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**Comments of the Project Coordinator**

Dated Signature

Initial Submission:

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First Review:

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Second Review :

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Final Comments :

## VEHICLE SEARCHING WITH DEEP LEARNING

### SURFA FARSEENA

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#### **Introduction & Objectives:**

Vehicle Searching System deals with detecting vehicle images from traffic surveillance videos. Nowadays traffic surveillance systems are installed in almost every city to record events and traffic. This surveillance videos can be used for vehicles searching with the help of Machine Learning. The system can be used by police officials to identify outlaw's vehicle in crime. Typically, police officials manually identify the vehicles in recorded video according to vehicle's appearances. This process is time-consuming and inclined to faults due to human fatigue for long duration videos. Moreover, hiring employees is costly. But with the help of Deep Learning it is possible to make this process more simpler. In this project, with the help of image processing and computer vision the vehicles are classified mainly based on two vehicle characteristics, i.e. types and colors. This project proposes a convolutional neural network framework to overcome the previously mentioned problems in vehicle searching in surveillance videos. CNN is a type of Deep Learning which is very well-known in image recognition field. This work mainly focuses on the performance of vehicle classification modules which are vehicle type classification and vehicle color classification.

#### **Problem Definition:**

#### **EXISTING SYSTEM:**

Object classification is usually a challenging field. Over the past years, vehicle classification system has been an active research area. There are a few researches which used CNN as a classifier in vehicle classification. The most common application for vehicle classification is counting to generate statistics about road usage. This is often applied to highways and free flowing traffic with cameras mounted high above the ground. A growing area of deployment for automatic surveillance systems is the urban environment where traffic control or policing like bus lane. Some proposed feature context as an approach to identify the color of the vehicle. They applied the classification with their dataset to predict the vehicle. Tree-based vehicle classification system were proposed to search for vehicle in surveillance videos. There are a series of relevant research papers attempting to accomplish this task in last decades, but they face various problems.

#### **Proposed System:**

The proposed system deals with searching vehicle from traffic surveillance videos. The proposed system consists of a CNN structures which are used as classifiers in both vehicle type classification and vehicle color classification. This method requires only one input which is a vehicle image fed into the system. The system extract the features of this vehicle image and perform classification on the extracted features. Finally the system detects vehicle from the video based on user input.

#### **User Modules:**

The proposed system consists of 3 modules, they are:

### **Modules**

- Feature Extraction
- Classification
- Search Manager

- Feature Extraction

In the proposed system traffic surveillance video is given as the input. In the feature extraction module, it crops the vehicle images from the video systematically. After cropping the video into images the module extracts the features of these images.

- Classification

The output of the feature extraction module is given to the classification module. In this module the classification is done based on two classifications. They are vehicle type and color. In the type classification, four classes are categorized. They are small, medium, large and unknown. In the case of color classification there are seven classes. They are black, white, blue, green, yellow, red, and unknown. Both classifications consist of unknown class. This class contains the vehicle with ambiguous characteristics and irrelevant colors. Overlapped vehicles and brown color are came under this category. The classifier in this work is convolutional neural network with two convolution layers. The vehicle images of dataset created is fed

In to CNN structure. Firstly, the original vehicle image is resized. The resized image is fed to the first convolutional layer. The output of the first convolution layer is modeled by the activation function ReLU. Then the output is passed to the second convolutional layer and the same operations are repeated. After that, the output of second convolution layer is converted into vector form and then fed into fully connected layer. The final layer is a predictor.

- Search Manager

After the classification process the vehicle images are stored into a model file. This model file is given to the search manager module to predict the output. The search manager module will stores and filters the results according to the given query commands. When a police official performs a search the search manager module loads the model file and input data together and compare them. The search manager returns the result to the police officials according to this comaparison through a user interface.

### **HARDWARE AND SOFTWARE REQUIREMENT**

This specifies the hardware and the support software required to carry out the development.

#### **HARDWARE REQUIREMENTS:**

It is recommended that for optimal performance, the following minimum hardware are installed on the server on which the portal is hosted, as well as on clients that access the portal.

1. Processor : Intel Pentium IV
2. Monitor : Min. 14

- 3. RAM : 256 MB
- 4. Hard Disk : 80 GB
- 5. Keyboard : Standard 104 Keys
- 6. Modem : 56 Kbps
- 7. Mouse : Serial mouse

#### SOFTWARE REQUIREMENTS:

For the proposed system to work properly, it is necessary that following software are installed and running on the server / client.

- 1. Operating System : Windows 8 or higher
- 2. Front End Tool : HTML, CSS, python
- 3. Back End Tool : MY SQL
- 4. IDE : PyCharm community, Android studio/eclipse
- 5. Web Browser : All new browsers