TRAFFIC BASED ALERT SYSTEM USING COMPUTER VISION

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Abstract

The environment is filled with mostly with traffic. Highway scenarios and has more problems with delays. This paper presents a traffic alert and updates the knowledge to the user. This protocol suggests to the user decide on an alternate route. Here we are focused on the develop an application based on the previous ieee papers. Our main task is detecting the vehicles using computer vision technology.

Keywords for Traffic based alert system using computer vision technology, Traffic prediction ,Location alarm, Emergency alert.

Introduction:

In our traffic based alert system using computer vision technology, for detection of the vehicle we use the popular algorithm. Based on the algorithm entire project will work. So here we are introducing the some features like location alarm, traffic prediction, vip support and emergency alert. These are all support with the google maps through our application. So user must be download our app.

Existed System(a):

Google Maps is one of the most popular applications in the world, and for good reason — it works very well.

Disadvantageous point are

1. While the count of mobiles is gathered at a single point then the traffic jam updates are faced by the user, even though the route is free, the application shows a route filled with traffic.

2. Based on the mobiles in that traffic area the application will work.

3. Fake traffic jams.

4. Limited accuracy

Existed System(b):

Arabian Journal for Science and Engineering:

•Based on google maps one of the world's universities discovered traffic congestion-aware solution.

•It's followed some of the modules like Traffic Intensity Monitoring Module, etc.

•The main drawback of this traffic congestion-aware solution is it only detects the smart vehicles. We are developing an application named Traffic Alert system based on this existed system.

Solution:

To solve this problem we provide a Suggestion, i.e., the Traffic Alert system, which is a software application that will suggest to the users to choose another route based on the traffic conditions. By this, we can easily reduce the traffic-based problems. With this solution, we can easily reduce those issues and solve many of the traffic-related problems. On the analysis of these data, we can give a prediction to the user for the given location with respect to the time. Here we provide an android application for the user to get the updates on hand. With this solution, we can easily reduce those issues and solve many of the traffic-related problems. On the analysis of these data, we can give a prediction to the user for the given location with respect to the time. Here we provide an android application for the user to get the updates on hand. We are using java and XML technologies to develop an android application. Results indicated the performance of the proposed protocol and reduce the travel time effectively.

Working:

Our smart idea is a Traffic Based Alert System using computer vision technology.

1. In this traffic alert system, we are using a camera.

2. This camera captures that, if the maximum count of vehicles is struck at a particular road, then it notifies the user in the mobile application.

3. The only thing that the user must do is download the application.

Procedure:

Here we are using Computer Vision Technology to detect the vehicle. Here we train our data with a large number of datasets that contains the images of the vehicles. While instructing the datasets we can convert each and every image in the dataset into Gray Scale images and compare the pixel values of all images and classify the images into vehicles with the support of a machine learning algorithm. After the training, we can take the images of the vehicle and recognize the images and count all the vehicles in the given images. We are using Python programming in Computer vision technology.

Computer Vision Technology:

Computer Vision Technology based on Artificial Intelligence.

Computer vision technology is works based on the artificial intelligence, which is developed for detection with using a camera. It is clearly detecting the digital images and videos. It visualize motion of the vehicles in our project. Through the sensors and cameras the motion will be detected. As per computer vision technology working the total hardware devices works based on the code of the particular devices like camera ,sensors ect. Computer vision technologies is the security or video surveillance domain. This technology could provide functionalities like detection and trip wire to the users.

Database:

The database is information that is set up for easy accessing and management overcoming. Here we are using google firebase as our database. By this, we have a lot of facilities for authentication, file storage, Realtime Database, and others. For training, the machine learning models also use this firebase. This firebase is mostly supported for android, ios, and web apps. Here it provides security for the data in different formats. The data is a NoSQL database and that data will be stored in tree architecture while accessing.

Based on the traffic our camera captures the long distancing traffic images and notifies the user.

All the data that it will collect needs to be seen in our mobile application. Here if something gets a heavy traffic alert, it needs to be notified and suggested to choose another route to the respective person who was driving the vehicle.

If you choose our Traffic alert system mobile application, we will help you to set up an alert notification if your nearest location getting traffic.

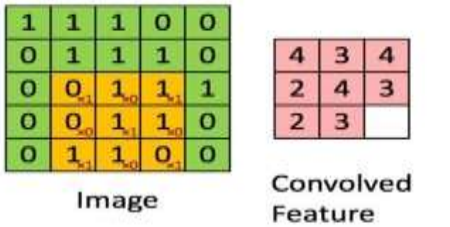
Convolution Neural Network algorithm:

CNN is type of auxiliary neural network used in image recognition and processing. CNN is a deep learning algorithm which will works with the support of neural networks which take input as images and various kinds of aspects.

CNN works similar to an artificial neural networks with the support of some activation functions and others. CNN get the internal pixel values of all images and pre process all information . There are three elements involved when we work with CNNs
Input image
Convolution Neural Network
Output (classified image class)
SVG viewer
Elements while working with CNN's
Here, CNN works in four steps. Convolution - the starting building block is the convolution operation..Pooling - in this lesson, you will learn exactly how it works. Our focus will be on a specific type of pooling i.e. max pooling. However, there are some different pooling available.

Features In CNN algorithm:

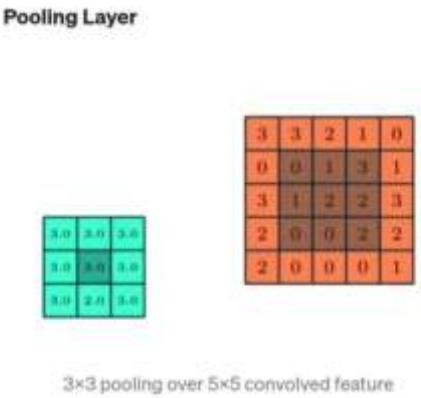
a) Kernel Filter:



Convoluting a 5×5×1 image with a 3×3×1 kernel to get a 3×3×1 convolved feature

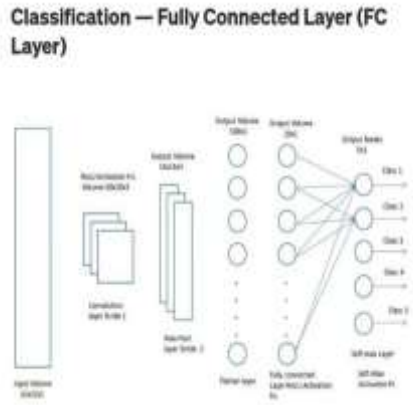
Filter that is used to extract the features from the images. This forces are machine Learning algorithm to learn features common to different situations and so to generalize better.

b) Pooling Layer



The pooling layer is transformed into a one-dimensional array of numbers, and connected to one or more fully connect layers, in which every input is connected to every output. Once the features are extracted by the convolution layers by the pooling layers are created, they are mapped by the subset of fully connected layers to the final outputs of the network.

c)Fully Connected Layer:



Fully connected layer operates on a flattened input where each input is connected to all neurons. If the present, fully connected layers are usually found towards the end of convolution neural network architectures.

Linear Regression:

Linear Regression is a supervised learning algorithm. Regression models mostly used to predict the vaues based on independent variables.

It works on a task to predict the dependent variable (y) based on the independent variable(x). So here we get a linear relationship between x &y because of this name is Linear Regression.

Here we plot the linear graph between x and y axis and draw the line for that and get the slope of that line.

So with those values we can predict the upcomming value.

Modules:

User Module

Admin Module

Emergency Module

User Module:

User module can communicate with ours through the application. If user create an account in application. The related details of traffic will be helped to the user. If user gets heavy traffic or emergency situation user will choose own another route.

Admin Module:

Admin module is right of admin to control the all of application monitoring. If user contacts the admin , admin should respond immediately. The full of rights about the application in the admin. Admin should immediately call for emergency support like ambulance services, fire services etc.

Emergency Module:

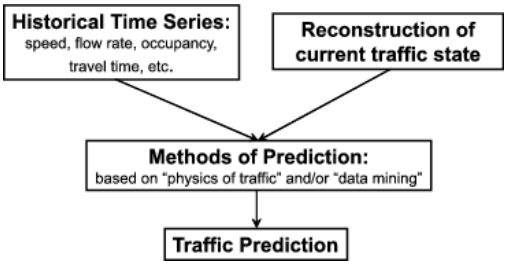
Emergency module is mainly caused for emergency situations. Emergency situations like ambulance services and fire services ,etc.,

Suggesting Features:

Location Alarm:

Location alarm is a feature when the user is not able to know about the destination, then that user will enter the destination details in the app. When the user reached the destination then our application will raise an alarm. So, our application will alert the user when he reaches his destination.

Traffic Prediction:



Traffic prediction allows the traffic manager to take early actions about to control the traffic load and prevents the congestion state, passing the information to passengers well ahead of time if their buses are going to encounter some obstacles.
Traffic prediction works based on the previous records of traffic at that particular area. The total information stored at the database , based on the traffic situations the alert notifications goes to the user.

VIP Support:

VIP support is feature which supports for the VIP traveling and the normal people also. Here admin user will update the timings of the VIP arrival timing so we can update that information in the app and it will push a notification to the user app to choose another route.

Emergency Services:

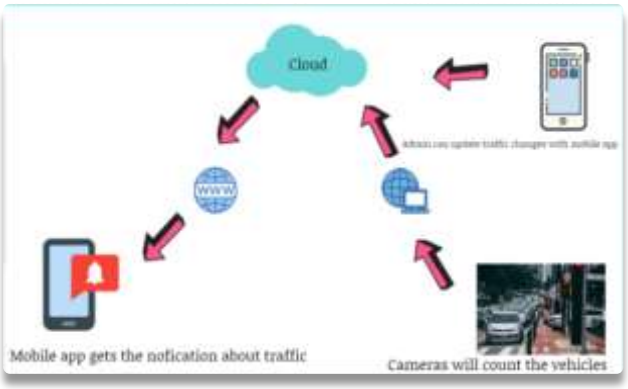
Emergency Service agencies are responds according to the user faces particular kind of emergency problems. For this the user must download our application in their mobile. In this application based on your location the nearest emergency service agencies are will activate.

There are three primary emergency services that can be summoned directly by the public as per road transportation :

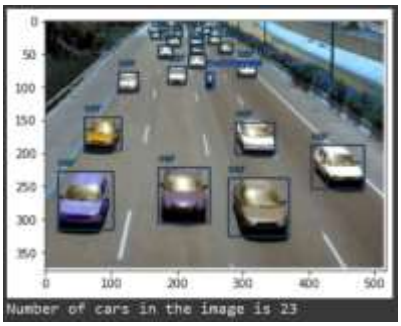
Ambulance — Emergency Medical Services agencies are responsible for immediate response to medical emergency calls. Ambulances are struck during the traffic period, so we let intimate the emergency services through our application. Then based on the locations nearly emergency servicemen are clear everything for route to the ambulance as much as possible.

Fire and **Rescue** Services — fire suppression, technical rescue, and hazardous materials mitigation. These services are provided to those who need help during any type of emergency. Some Fire and Rescue services agencies also provide emergency medical services.

Flow Diagram:



Result:



Computer Vision Technology to detect the vehicle.

Here we are detecting the vehicles using machine learning, then the data stored in the data base. For the data storing we use firebase. The count of vehicles detected at the particular traffic point,user wants getting alert for the traffic he must download our app. so based on the on the traffic prediction data base the user choose another route. Traffic prediction contains the data of traffic date, time and location. And the location is based on the google maps. If the count of vehicles are detected at the traffic point our application will alert the user and intimating to the user choose another route.

So here the travel time is decreases for the user. And we are also providing different new features like emergency alert, vipsupport that are useful for our user.

On the analysis of these data, we can give a prediction to the user for the given location with respective of the time. Here we provide an android application for the user to get the updates to on hand.

We are using **java** and xml technologies to developing an android application. Results indicated the greater performance of proposed protocol and reduce the travel time effectively.

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