

Density Based Smart Traffic Control Using Canny Edge Detection Algorithm

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Abstract

Background: The project which is entitled as density based smart traffic control system using canny edge detection algorithm for congregating traffic information deals with problem of urban traffic congestion. As the population in the urban areas increasing there is a necessity for a effective and smart traffic control system using advanced and latest technology and equipment to improve the traffic control. The current methods for controlling traffic are timers or human control are proved to be ineffective as the traffic is increasing rapidly. In this project we are developing a method where the time is allocated according to the measure of the vehicle density using canny edge detection with digital image processing is proposed. This imposing traffic control system offers great improvement in response time, vehicle management, automation, reliability and overall efficiency over the existing systems. To implement this technique we are uploading the current traffic image to the application and application will extract edges from images and if there is more traffic then there will be more number of edges with white color and if the uploaded image contains less traffic then it will have less number of white color edges.

Objectives:

Malicious attacks are increasing day by day though many techniques are used to avoid them.

DDoS attacks are the major threats these days.

We are proposing an approach to detect those attacks by using co-clustering algorithm

Methods:

1.Data preparation

In this method modern-day site visitors photograph could be uploaded to the machine after which convert shadeation photograph into Gray Scale photograph layout to have pixels values as black and white shadeation.

2. Image analyzing

In this method Gaussian Filter may be implemented on uploaded pix to transform the photograph into clean format. After making use of the clear out out Canny Edge Detection may be implemented at the photograph to get the rims from the photograph. Images are preprocessed.

3. white pixel count module

we can be counted number white pixels from a canny photograph to get whole visitors be counted number. After side detection, the ensuing pics are binary photograph with most effective black and white pixels

4. Calculate Green Signal Time Allocation

Based on white pixel count traffic signal time will be Allotted

Conclusions: In this venture an powerful visitors manage machine availing picture processing as an device for measuring the density has been proposed. Besides explaining the constraints of contemporary close to useless visitors manage machine, the blessings of the state-of-the-art visitors manage machine had been explained. For this venture, pattern snap shots of various visitors situation can be provided. After of of entirety of side detection, the similarity among pattern snap shots with the reference picture can be analysed.

Keywords: Co-clustering , Entropy analysis , Information gain ratio , Feature selection ·

1. Introduction

In recent days visitors, congestion has ended in fundamental disaster in each massive town in the world. Recently a have a look at of global wide financial institutions has said that the car's common velocity has reduced from 21km to 7km in line with hour with inside the remaining 10 years. The necessity for superior and modern visitors to manage machines with today's technology to make use of the already gift infrastructures to its complete extent. There are many different distinct techniques to govern visitors' records like counting the overall variety of pixels and calculating the reliability of vehicles. In this task, we're the usage of the can't Edge detection method that is powerful to extract the specified visitor's facts from the CCTV footage. There are many part detection strategies to be had a number of them are Prewitt, canny, Sobel, Roberts, and LOG. It has been proved with inside the have a look at that the Canny part detector offers better accuracy in detection of items with better entropy and execution time.

The present Machine Learning primarily based totally DDoS detection strategies may be divided into 3 categories. Supervised ML strategies that use generated classified community visitors datasets to construct the detection model. Two predominant troubles are dealing with the supervised strategies. First, the technology of classified community visitors datasets is steeply-priced in phrases of computation and time. Without a non-stop replace in their detection models, the supervised gadget mastering strategies are not able to expect the brand new valid and attack behaviours. Second, the the presence of massive quantity of beside the point regular statistics with inside the incoming community visitors is noisy and decreases the performances of supervised ML classifiers. Unlike the primary category, with inside the unsupervised strategies no classified dataset is wanted to constructed the detection model. The DDoS and the regular traffics are prominent primarily based totally at the evaluation in their underlying distribution characteristics. However, the primary disadvantage of the unsupervised strategies is the excessive fake fantastic rates. In the excessive dimensional community visitors statistics the space between factors will become meaningless and has a tendency to homogenize. This problem, regarded as 'the curse of dimensionality', prevents unsupervised strategies to correctly locate attacks. The semi-supervised ML strategies are taking advantages of each supervised and unsupervised strategies through the capacity to paintings on classified and unlabeled datasets. Also, the mixture of supervised and unsupervised strategies permits to growth accuracy and reduces the fake fantastic rates. However, semi-supervised strategies also are challenged through the drawbacks of each strategies. Hence, the semi-supervised strategies require a complicated implementation of its additives so as to triumph over the drawbacks of supervised and unsupervised strategies.

2. Objectives

This phase introduces our method to locate the DDoS assault. The five-fold steps software manner of information mining strategies in community structures mentioned in characterizes the followed method. The fundamental purpose of mixing algorithms used withinside the proposed method is to lessen noisy and beside the point community visitors information earlier than preprocessing and type tiers for DDoS detection even as preserving excessive overall performance in phrases of accuracy, fake fine price and strolling time, and low sources usage. Our method begins offevolved with estimating the entropy of the FSD capabilities over a time-primarily based totally sliding window. When the common entropy of a time window exceeds its decrease or top thresholds the co-clustering set of rules cut up the acquired community visitors into 3 clusters. Entropy estimation over time sliding home windows lets in to locate the abrupt adjustments withinside the incoming community visitors distribution which are frequently resulting from DDoS attacks. Incoming community visitors withinside the time home windows having abnormal entropy values is suspected to incorporate DDoS visitors. The recognition handiest at the suspected time home windows lets in filtering vital quantity of community visitors information, consequently handiest applicable information is chosen for the last steps of the proposed method. Also, vital sources are stored while no abnormal entropy occurs. In order to decide the everyday cluster, we estimate the records benefit ratio primarily based totally on the common entropy of the FSD capabilities among the acquired community visitors information at some point of the modern time window and every one of the received clusters. As mentioned withinside the preceding phase at some point of a DDoS length the generated quantity of assault visitors is basically larger than the everyday visitors.

Hence, estimating the records benefit ratio primarily based totally at the FSD capabilities lets in to pick out the 2 cluster that hold more records approximately the DDoS assault and the cluster that carries handiest everyday visitors. Therefore, the cluster that produce decrease records benefit ratio is taken into consideration as everyday and the last clusters are taken into consideration as anomalous.

3. Methods

We have four methods involved in this project

Data preparation

In this module modern-day site visitors photograph could be uploaded to the machine after which convert shadeation photograph into Gray Scale photograph layout to have pixels values as black and white shadeation.

Image analyzing

In this module Gaussian Filter may be implemented on uploaded pix to transform the photograph into clean format. After making use of the clear out out Canny Edge Detection may be implemented at the photograph to get the rims from the photograph. Images are preprocessed.

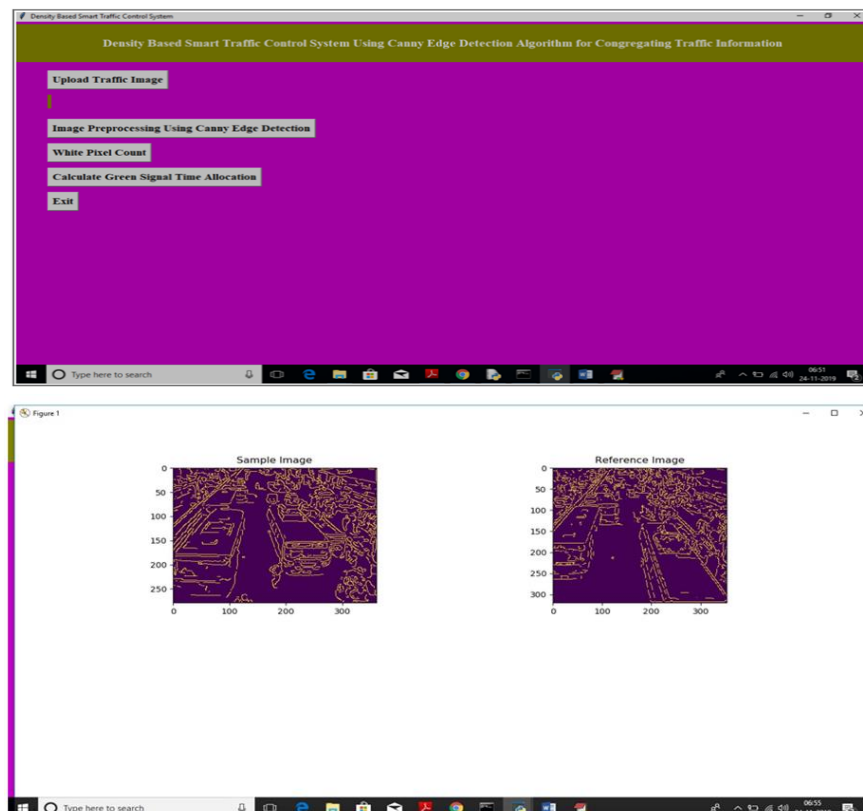
White pixel count module

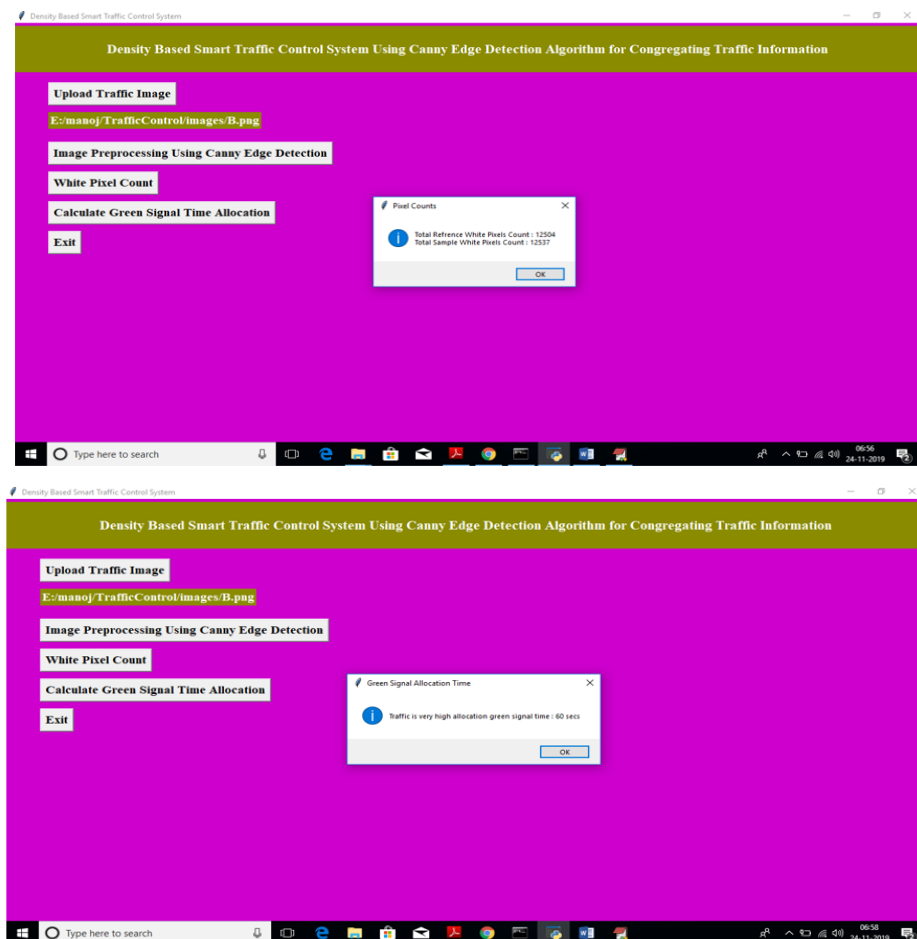
Using this module we can be counted number white pixels from a canny photograph to get whole visitors be counted number. After side detection, the ensuing pics are binary photograph with most effective black and white pixels. Binary photograph is initially a dimensional matrix of values zero and 1. The value 'zero' denotes black colour whilst value '1' denotes white colour. The white pixels basically constitute the detected edges. So, pics with distinct visitors situations can have distinct white factor counts.

Calculate Green Signal

Time Allocation Based on white pixel count traffic signal time will be Allotted.

4. Results





5. Discussion

A GUI application is developed using Anaconda,python,different packages in python.

- 1.We should upload the traffic image by clicking on the upload traffic image button.It uploads the image.Then click on the Image preprocessing using canny edge detection Then the image will be preprocessed and the images gets changes .
- 2.Click on the White pixel count to get the count of white pixels
- 3.Click on the calculate green signal time allocation to get the time period which is displayed according to the vehicle density count. According to the image that we have uploaded the time period is calculated with respective to white pixel count.
- 4.Click on the exit button to get exit from gui.

References

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