

VIDEO BASED VEHICLE IDENTIFICATION AND MONITORING USING OPEN-CV

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ABSTRACT

There is a vast increase in number of vehicles day by day. To monitor, Identification and Track them is a big challenge. So a video- based vehicle capturing and analysis of that video makes this challenge simpler and quicker. In this project we came up with a solution for the above problem using OpenCV -Python as a tool. We have used adaptive thresholding method, background subtraction and blob tracking as our key methods in project. A vehicle detection system is an application of an object detection system in which the primary focus is on tracking the vehicle using its coordinates in the images or videos The implementation was done using OpenCV Python as a tool. Our proposed system can identify, track the vehicle precisely. This project helps us in the easy monitoring of vehicles and also help in identification of them using this background subtraction and by blob tracking we can even track the vehicle

Keyword :- - Open -CV, Legacy Module, Machine Learning

1.INTRODUCTION

Machine learning programming computers to optimize a performance criterion using example data or experience. We have a model defined up to some parameters, and learning is the execution of a computer program to optimize the parameters of the model using the training data or experience. The model may be predictive to make predictions in the future, or descriptive to gain knowledge from data. The field of study known as machine learning is concerned with the question of how to construct computer programs that automatically improve with experience Our proposed system can identify, track the vehicle precisely. This project helps us in the easy monitoring of vehicles and also help in identification of them using this background subtraction and by blob tracking we can even track the vehicle. Now a days vehicle identification and tracking had became a major task to us so we came with this video based identification and tracking of vehicle as a solution .The OpenCV library includes eight algorithms for object tracking, which are available through OpenCV tracking API. The 8 different trackers available in OpenCV 4.2 --BOOSTING, MIL, KCF, TLD, MEDIANFLOW, GOTURN, MOSSE, and CSR. Each algorithm have different features in it for object identification and tracking the object. Each algorithm has different features in it for object identification and tracking the object. In the first step classifier takes in an image patch as input and returns a score between 0 and 1 to indicate the probability that the image patch contains the object. The score is 0 when it is absolutely sure the image patch is the background and 1 when it is absolutely sure the patch is the object. In proposed system we open a video and grab a frame. We define a bounding box containing the object for the first frame and initialize the tracker with the first frame and the bounding box. In the proposed system we can track any vehicle based on our need and we can also select multiple vehicles also. This project can also work with live camera footage, which will be a great help for traffic police

2.IMPLEMENTATION

In this project main methodologies of this object tracking in a video are making the selected part of image as the object and treating all the remaining part as the background for the image. After this we use the open-cv module to import and use the trackers which are predefined and the process of selection of tracker from the set of tracker list just depends on the kind of video or size and difficulties to find the object in the video. The project start with ,We then open a video and grab a frame. We define a bounding box containing the object for the first frame and initialize the tracker with the first frame and the bounding box. Here the image blurring and background detection occur the first step classifier takes in an image patch as input and returns a score between 0 and 1 to indicate the probability that the image patch contains the object, The score is 0 when it is absolutely sure the image patch is the background and 1 when it is absolutely sure the patch is the object. After differencing the object from background we need to track the object with different tracking algorithms like BOOSTING, MIL, KCF, TLD, MEDIANFLOW, GOTURN, MOSSE, and CSR. Every tracker has its own situation to be used

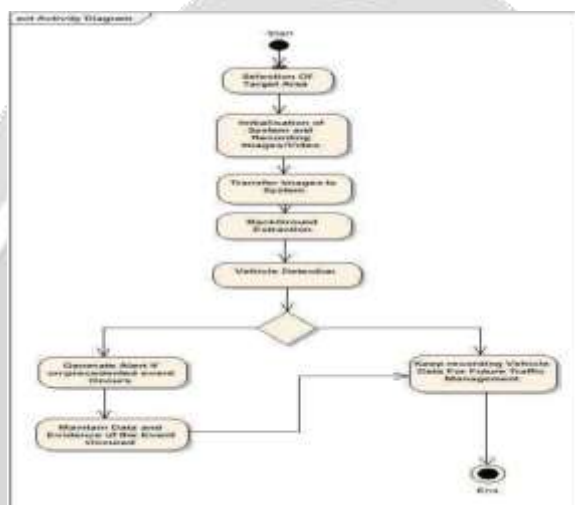


Fig -1: Activity Diagram

The initial bounding box supplied by the user is taken as a positive example for the object and image patches outside the bounding box are treated as the background. Given a new frame, the classifier is run on every pixel in the neighbourhood of the previous location and the score of the classifier is recorded. The new location of the object is the one where the score is maximum This tracker utilizes the fact that the multiple positive samples used in the MIL tracker have large overlapping regions. This overlapping data leads to some nice mathematical properties that are exploited by this tracker to make tracking faster and more accurate at the same time.KCF tracker reports tracking failure better than boosting Multiple Instance Tracker

2.1 MODULE USED

The UML DIAGRAMS are as follows.



FIG-2:USECASE DIAGRAM

The above usecase diagram represents the enhanced application flow. Usecases diagram are one of the five Diagrams in UML Diagrams. It shows a set of usecases, Actors and their Relationship. It also contains notes

and constraints. Use case diagrams are used to describe the functionality of the system. Use case diagrams have four major modules: The actor that the system interacts with, the system itself, or services 27 that the system knows how to perform, and the lines that represent relationships between these elements

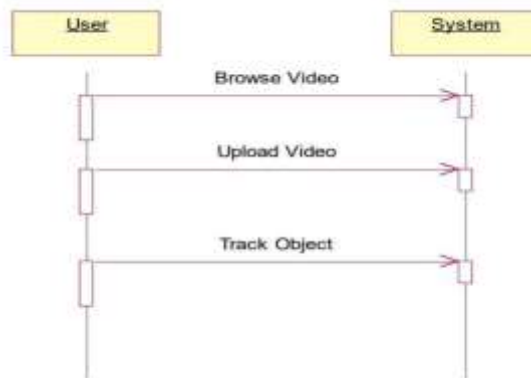


FIG-3: SEQUENCE DIAGRAM

A sequence diagram in a Unified Modelling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality

3.RELATED WORK

“Object Tracking Algorithms for video surveillance applications” by Akshay Mangawati, Mohana, Mohammed Leesan, H. V. Ravish Aradhya . The low accuracy of this paper we are trying to overcome in our project. I think by the technology we use is ML and Open-CV there was growth in accuracy. In this project there was no hardware implemented to make this device or project portable.

4. RESULTS



Fig -3:Input Video



Fig -4:Selecting Vehicle in video**Fig -5:Output Photo**

5.CONCLUSION

The proposed system has been implemented in PyCharm for application development is developed using python. The tasks involved in this work are divided into modules. The proposed system is efficient and make the monitoring process easy and simple. The proposed system can work efficiently for live video source also.

6.FUTURE WORK ENHANCEMENTS

This project can be made more useful by including speed finder module ,by which we can find the speed of selected vehicle.In future we can add new modules to this project which can help us in finding type of vehicle like car ,bus, jeep ,bike

7. REFERENCES

- [1]. Adrian Rosebrock, "Object detection with deep learning and OpenCV", pyimagesearch.
- [2]. ShreyamshKamate, "UAV: Application of Object Detection and Tracking Techniques for Unmanned Aerial Vehicles", Texas A&M University, 2015
- [3]. AkshayMangawati, Mohana, Mohammed Leesan, H. V. Ravish Aradhya, "Object Tracking Algorithms for video surveillance applications" International conference on communication and signal processing (ICCSP), India, 2018, pp. 0676-0680.