**CRUISE ASSIST USING OPENCV**

Name: Pokuri Chaitanya Swaroop

Department: Operational Managemnet and Information System

Course Number: OMIS 690

Course Name: Information Technology Project Management

Title: Cruise assist using opencv.

Date of submission: 01-21-2019

**INTRODUCTION**

Moving object detection is a computer technology related to computer vision, image processing, neural network that deals with detecting instances of semantic objects of a certain class ( such as human, cars etc. ) in digital image or video. Well researched domains include vehicle detection, pedestrian detection. Moving object detection has many applications in the domain of computer vision, including image retrieval and video surveillance. Moving object detection for real world applications is still a challenging problem. While recent research datasets increases the amount of training sets and testing examples to get closer to the real world problems, the ability of detectors to process large data sets in reasonable time becomes another important issue besides accuracy. It is not only the training examples that matters, but also the number of classes.

Moving object detection involves locating objects in the frame of a video sequence. Every tracking method requires an object detection mechanism either in every frame or when the object first appears in the video. In moving object detection various background subtraction techniques available in the literature were simulated. Background subtraction involves the absolute difference between the current image and the reference updated background over a period of time. A good background subtraction should be able to overcome the problem of varying illumination condition, background clutter, shadows, camouflage, bootstrapping and at the same time motion segmentation of foreground object should be done at the real time. The moving object tracking in video pictures has attracted a great deal of interest in computer vision. Object tracking is the first step in surveillance systems, navigation systems and object recognition. There is a huge significance of object tracking in real time environment as it enables several important applications such as to provide better sense of security using visual information, Security and surveillance to recognize people, to analyse shopping behaviour of customers in retail space, video abstraction.

**Importance of object detection**

Biometric recognition: Biometric technology uses human physical or behavioural traits to recognize any individual for security and authentication. Biometrics is the identification of an individual based on distinguished biological features such as finger prints, hand geometry, retina and iris patterns, DNA, etc. For biometric analysis, object recognition techniques such as template matching can be used.

Surveillance: Objects can be recognized and tracked for various video surveillance systems. Object recognition is required so that the suspected person or vehicle for example be tracked.

Industrial inspection: Parts of machinery can be recognized using object recognition and can be monitored for malfunctioning or damage.

Content-based image retrieval (CBIR): When the retrieval is based on the image content it is referred as CBIR. A supervised learning system, called Onto Pic, which provides an automated keyword annotation for images and content–based image retrieval is presented in.

Robotic: The research of autonomous robots is one of the most important issues in recent years. The humanoid robot soccer competition is very popular. The robot soccer players rely on their vision systems very heavily when they are in the unpredictable and dynamic environments. The vision system can help the robot to collect various environment information as the terminal data to finish the functions of robot localization, robot tactic, barrier avoiding, etc. It can decrease the computing efforts, to recognize the critical objects in the contest field by object features which can be obtained easily by object recognition techniques

Medical analysis: Tumour detection in MRI images, skin cancer detection can be some examples of medical imaging for object recognition.

Optical character/digit/document recognition: Characters in scanned documents can be recognized by recognition techniques.

Human computer interaction: Human gestures can be stored in the system, which can be used for recognition in the real-time environment by computer to do interaction with humans. The system can be any application on mobile phone, interactive games, etc.

Intelligent vehicle systems: Intelligent vehicle systems are needed for traffic sign detection and recognition, especially for vehicle detection and tracking. In, such a system is developed. In detection phase, a colour-based segmentation method is used to scan the scene in order to quickly establish regions of interest (ROI). Sign candidates within ROIs are detected by a set of Haar wavelet features obtained from Adobos training. Then, the Speeded up Robust Features (SURF) is applied for the sign recognition. SURF finds local invariant features in a candidate sign and matches these features to the features of template images that exist in data set.

**Existing system**

Region-based object tracking model: The region based object model bases it’s tracking of objects on the colour distribution of the tracked object. It represents the object based on the colour. Hence, it is computationally efficient. However, its efficiency is degraded when several objects move together in the image sequences. It is not possible to achieve accurate tracking when multiple objects move due to occlusion. Also, in the absence of any object shape information, the object tracking is largely dependent on the background model used in the extraction of the object outlines.

**Proposed system**

First, a classifier (namely a *cascade of boosted classifiers working with haar- like features*) is trained with a few hundred sample views of a particular object (i.e., a face or a car), called positive examples, that are scaled to the same size (say, 20x20), and negative examples - arbitrary images of the same size. After a classifier is trained, it can be applied to a region of interest (of the same size as used during the training) in an input image. The classifier outputs a “1” if the region is likely to show the object (i.e., face/car), and “0” otherwise. To search for the object in the whole image one can move the search window across the image and check every location using the classifier. The classifier is designed so that it can be easily “resized” in order to be able to find the objects of interest at different sizes, which is more efficient than resizing the image itself. So, to find an object of an unknown size in the image the scan procedure should be done several times at different scales.

**Questions**

1) Why did this become a project.

Ans: From the TextBook definition a project is something that replaces the old system or an introduction to a new system that was associated with some particular purpose.

2) What was the return on investment (if any) that the company was looking for.

Ans: As this is a Bachelors Degree project, the university is not concentrated in any financial returns rather it wanted us to inculcate the sound knowledge in the field of project study.

3) Why was this project chosen.

Ans: As I have interest in this field and automation has many advantages like fuel saving , less accidents and it is safer .

4) Was the project considered successful.

Ans: This project is successful as it was tested by the faculty of our university and it has given knowledge and an aware of the automation system .

.