Abstract

In this paper a comparison between many types of moving object detection methods is presented, one of these used methods is proposed depending on a combination between many detection methods with many enhancements. A novel method is proposed depended on a combination between one of the previous method with some enhancement and the edges technique. All of these methods are applied to detect three types of objects their movement. The objects are moved through a conveyer belt, thus these movements have a known speed and direction. The objects have to be griped and moved to a known location using a robot arm. The most important issue here is how to detect the objects according to their details in order to grip and move them to other location in a real time; the processing time, the robot movement time inside the images capturing time must be adjacent to zero, Thus it is important to apply many well methods over the same environment for the same types of objects to compare between the methods and select the best one to be used according to the time and the detection accuracy. The objects are detected by a stationary camera mounted with the conveyer belt, it is used to see any changes happened inside the used conveyer, thus a real
time video using this camera is recorded immediately and the video’s frames those included some changes (objects detected) have to be sent to a processing unit (Matlab code in pc); when the process operation is completed, the objects will be selected according to their features to be moved to other location, a robot arm (type Rios) is used here for gripping the selected objects (during their movement) to a known location. The comparison between the used detection methods is done according to the processing time and the detection accuracy. Firstly the used moving object detection methods are classified into two groups according to their processing time, the best group that has the lowest processing time will be selected to be used in real time applications, and then the best detection accuracy method in this selected group has to be used for the application. The (PCC) Percentage Correct Classification is used as a selection factor to choose the best method in the selected group. The obtained results shown that the new proposed method (Morphological Operation with the Prewitt Edge Detection with the region of interest), is selected according to its low processing time and high detection accuracy to be used for the industrial application.

References

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Index Terms

Computer Science
Algorithms

Keywords

Moving Objects Detection, processing Time, percentage correct classification (PCC), Detection Accuracy, Conveyor Belt, Robot Arm, and Camera