GARBAGE DETECTION AND COLLECTION OF GARBAGE USING COMPUTER VISION

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ABSTRACT

Despite the vast number of solutions implemented by the competent authorities, the process of garbage management is becoming tedious. The garbage generated is comparatively more than the amount of the garbage which is managed on a daily basis. Hence forth taking all these factors into consideration, a smart system could present a viable solution towards efficient waste management. In this paper we are presenting a smart system which is based on embedded, digital image processing and IoT(internet of things). The system is so designed that it will automatically detect and collect the garbage and after the collection a notification will be send to the user. The paper describes the overall view of the system. In the last section, we will discuss the future applications which will be included in the extended scope of the smart system. The paper describes the basic idea of detection and collection. The detection is done by using the image processing algorithm i.e. canny edge detection. Raspberry pi camera will capture an image of a particular area, and will store it as default image. Once an object has been detected, the camera will capture its image. It will identify the object as garbage, and then further send the signals. The edge detection algorithm is used for the differentiation of the scattered edges and compact and collinear edges of the garbage. Thus further collection of the garbage will be done by using vacuum module. Once the camera detects the garbage, it will calculate its position, calibrate the motors according to the position of the garbage so that it will go the acquired position and collect the garbage. Once the dustbin is full up to a certain limit, the level sensor in the bin will sense the level of the garbage and send it to the nearest garbage collector truck.

INTRODUCTION

In today's world where time is crucial entity and everyone is searching for an option to do things with fewer efforts, it is hard to keep time for things such as cleaning and maintaining a healthy environment. It is really a difficult task to keep a particular area clean. Even with help of appliances such as vacuum cleaner one has to find time to do all the chores. But whatever may be the problems it is significantly important to maintain a clean and healthy environment. Now days many diseases are caused only because the place where you sit or live does not have a healthy clean ambience. Even it is necessary to have a clean office environment. Plus with wide increase in industrial sector it is difficult to clean each and every space by a human. As this industrial sector is increasing so is this corporate sector and with that the number of Impossible for him or her to-do the other chores. In today's busy world, everyone is looking for an option to do things with fewer efforts. In this era is of technology it is possible to construct and use this technology for the purpose mentioned above. Thus taking all this into considerations we are working to develop a robot that will automatically detect the garbage and collect it. This will help in every aspect in keeping the environment clean in the near future.
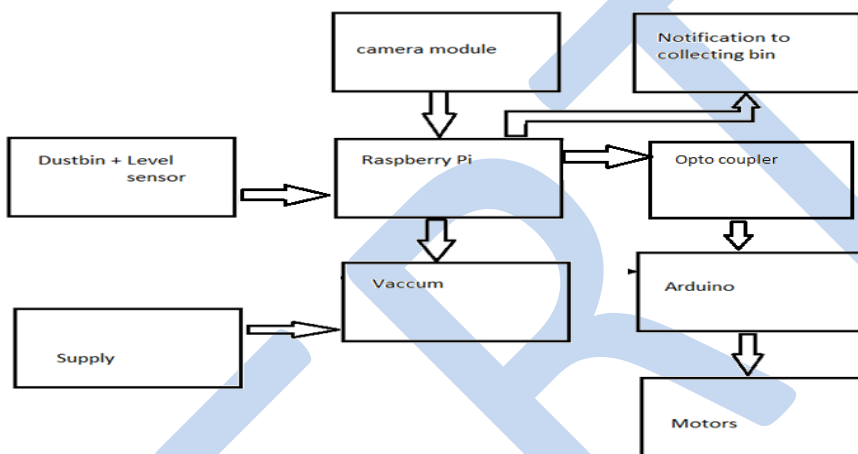
LITERATURE REVIEW

We have designed this project to overcome these primary level problems. As mentioned in the algorithm the robot will automatically detect the garbage and then will pick it up.

Thus for detection of object whether it is garbage or not we have used the feature of edges for detecting it. As edge detection provides the following the properties.

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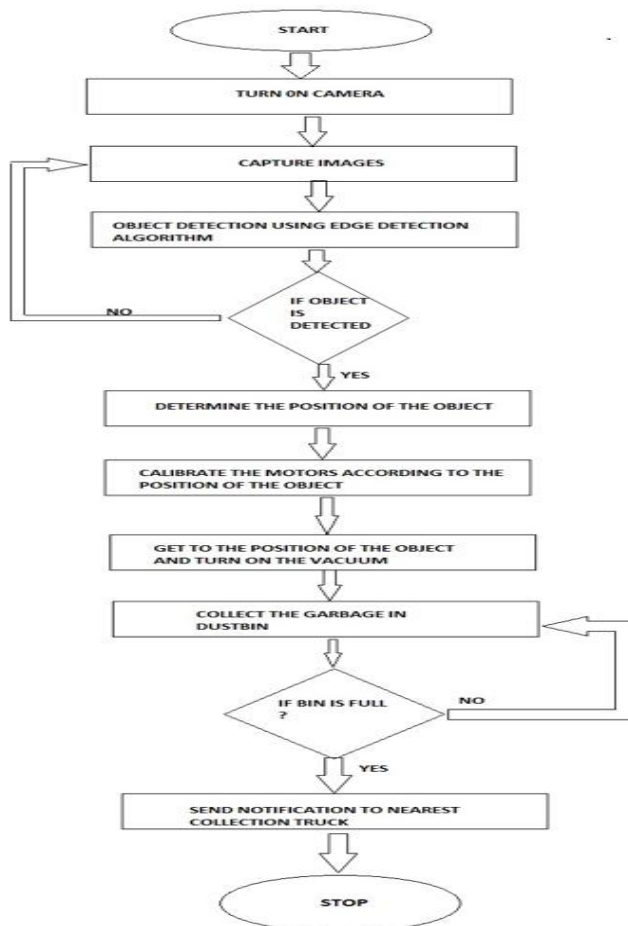**8 |** P a g e

(a) Good detection (b) Good localisation - (c) Minimal response .The processor used for compilation of the project is the raspberry pi. The raspberry pi is used because of its unique specifications such as it has 64 bit os etc. At the first stage of the designing we worked on the digital image processing part and hence using edge detection algorithm. Then we worked on the chassis and compilation of the project. The motors used are stepper motor. We have used stepper motor as we calculated the load that will be enforced upon the robot.

METHODOLOGY

The project has the basic idea of detection and collection. The detection is done by using the image processing algorithm. Raspberry pi camera will capture an image of a particular area, and will store it as default image. Raspberry pi camera will continue capturing images and will compare the captured images with default image .Once an object has been detected, the camera will capture its image. It will identify the object as garbage, and then further send the signals. The edge detection algorithm is used for the differentiation of the scattered edges and compact and collinear edges of the garbage. Thus further collection of the garbage will be done by using vacuum function.

ALGORITHM

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9 | P a g e

CONCLUSION

This paper presents the overall working and description of the system of detecting and collecting garbage. The detection is done by computer vision that is by camera and opt couplers. The collection is done by Vaccum unit that is takes all the garbage and cleans the area.

RESULTS

With the help of computer vision, the system is able to detect the garbage and turn on the motor.

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10 | P a g e