International Journal of Engineering Applied Sciences and Technology, 2021
Vol. 6, Issue 6, ISSN No. 2455-2143, Pages 171-173
Published Online October 2021 in IJEAST (http://www.ijeast.com)

CASE STUDY OF WASTE COLLECTION AUTONOMOUS ROBOT

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Abstract— **Autonomous trash-collecting robots have been considered as the benchmark for the mobile robot design problem. These include several common tasks such as navigation, path planning, object detection and discrimination, obstacle avoidance, task sequencing, and often multi-agent coordination. An autonomous robot can obtain information about its surrounding environment, work for more time without human intervention, move either all or part of itself throughout its operating environment without human assistance, avoid situations that are harmful to humans, public property, or itself unless those are specified in design specifications. In this type, the developed robot can autonomously collect trash using excavators like dotted hole claws. The pickup trash is segregated (metallic and nonmetallic) and dumped into a bin attached to the robot which has separate partitions for metallic and nonmetallic trashes. In addition, the developed embedded electronics module, a motor closed-loop speed control system, and optical flow system to detect and avoid obstacles and track the trash to be collected. Also, it is connected to the charging station through a WIFI module. It is a WIFI**
module useful when coming for dispatch full limit of bin trash. They can also adapt to changing surroundings. Like other machines, these robots need regular monitoring and maintenance for proper performance.

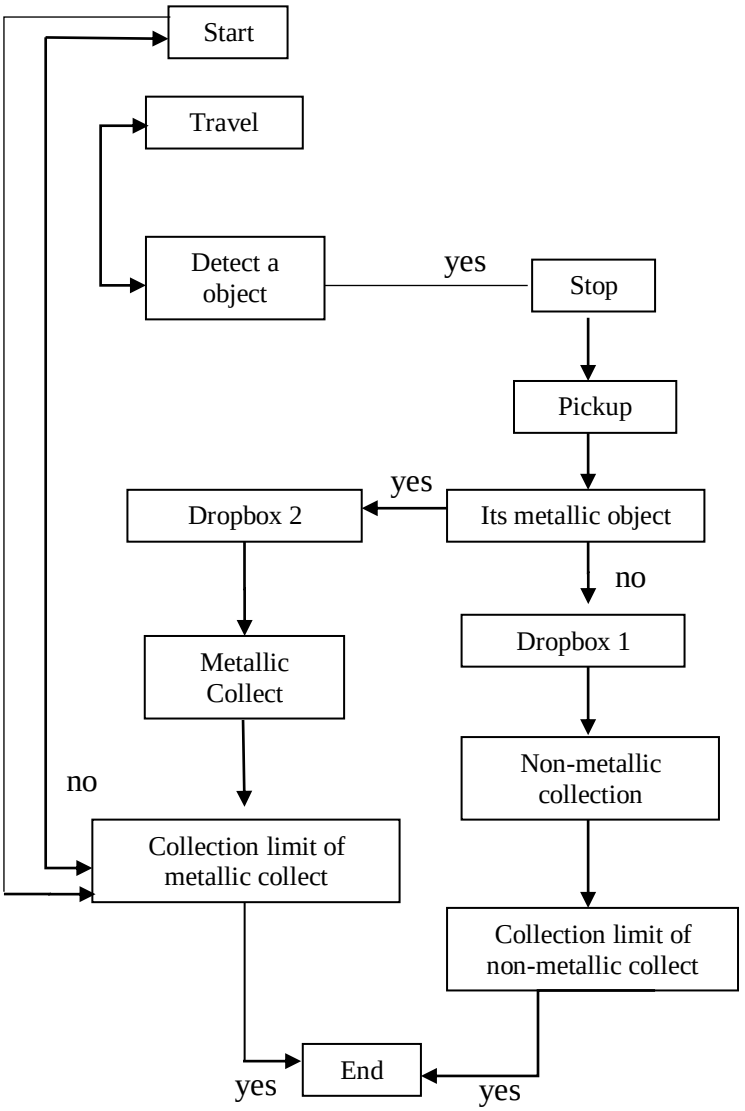
Keywords— **Beach Cleaning, Waste management, Segregation, Wireless, Autonomous**

I. INTRODUCTION

Trashbot Beach Cleaner Robot is a robust tracked beach cleaning machine based on two electric motors and powered by fully isolated Li-ION batteries and a solar panel. Its undercarriage is based on high-quality 100% natural rubber tires able to offer an excellent grip action even on wet sandy surfaces.

These include several common tasks such as navigation, path planning, object detection, and discrimination, obstacle avoidance, task sequencing, and often multi-agent coordination. The development of garbage pickup robot which operates on the sand and also discarded by itself. The developed robot can autonomously collect trash using an arm. In addition to detailing the system design and construction, this robot presents the description of the developed embedded electronics module.

II. PROPOSED ALGORITHM



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On the first, the robot will start with the manual switch. When it gets to start the sensor will come in contact or working condition. With the use of a motor robot, it will collect the objects that fell in its range. It will stop at the specific distance where the sensor will sense an object. Then servo motor which we have installed to control the arm movements. By the use of a servo meter, the arm picked up the object and will put it in the attached bucket which has 180-degree rotation for segregation (i.e, separate parts for metal and non-metal) if the pickup trash is a metal object then the bucket will rotate to rotate part and trash will go down to the metal section, once it gets done it will rotate back to its normal position. Then again the motor will start in the forward direction and whenever the sensor will sense an object in its range the robot will move in that direction, the same process will happen again; STOP-PICKUP-DETECT AN OBJECT-SEGRAGATE THE TRASH. By this continuous process if the bucket gets full or overloads the user will get the notification message from the system.

B. Block diagram/Simulation and Modeling

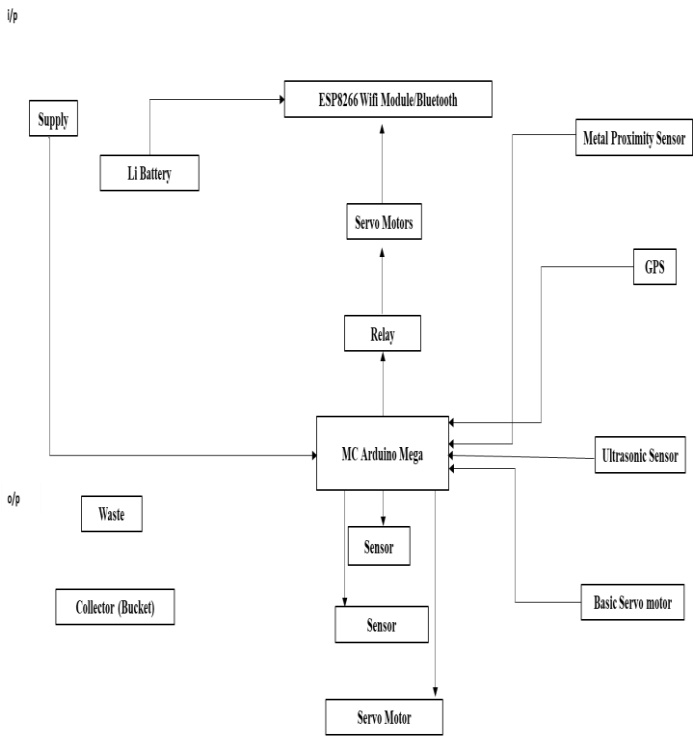

Fig. 1. Watermark Extraction algorithm Block Diagram

III. SIMULATION AND MODELING

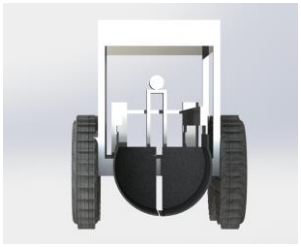

Fig.2 Front View

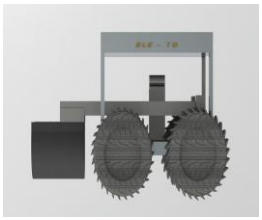

Fig.3 Right Hand Side View

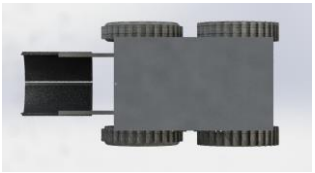

Fig.4 Top View

(The whole model is designed in Catia V5 And the analysis has also been carried out using the same software)

As a modular robot, a requirement for a project was to collect trashes and cleaned the beach and our surroundings. To achieve this goal the designed body of the robot was made of acrylic. Its construction and design, together with the materials used, grant the desired durability and endurance for a wide range of possible working environments. Its dimensions are 450mm in length, 300mm breadth, and the height will be decided later according to the bucket while the arm's total length is 450mm. Also, the palm radius is going to be 10mm respectively.

IV. CONCLUSION

We conclude that by the time we complete this project, so basically by making this project we are not only helping in making the beaches clean but also advancing the use of technology by introducing this technique in the cleaning field. With simplicity in the process by changing the system into manual mode whenever needed, it will help the user to control it in a very easy way.

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