ROBOTIC TRASH COLLECTOR BOAT TO DRIVE FLOATING TRASH USING AI

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ABSTRACT −

The main aim of the project is to remove down the floating trash in the urban drain, to reduce down the blockage of sewage. By cleaning down this urban drain without the manual help will save many lives. In this proposed system, an automated robot is used to clean down the floating trash. Hence the contact with the harmful gases and the mosquitoes will be reduced. The system has an PiNoIR camera which detects down the waste by image processing and the automated robotic arm will collect the floating trash and this will have a bin in the boat where the trash will be stored. Once the trash has been filled the IR sensor will detect it. when IR sensor gives out this information automatically the boat will move to the hub with an help of GPS and the trash will be thrown over there. This system will be more advanced as this would collect down the floating non degradable wastes with the help of the image processing.

Keywords: Image Processing, Trash, Drainage, Automation, Camera, Sensor

INTRODUCTION −

The world is facing a major problem of plastic pollution, and the oceans are the most affected by it. To combat this issue, scientists have come up with a new solution – the Robotic Trash Collector Boat. This boat uses Artificial Intelligent techniques to collect trash from the ocean and dispose of it properly. In this presentation, we will discuss the various features and benefits of this innovative technology.

The Robotic Trash Collector Boat is an autonomous vessel that is designed to navigate through the water and collect plastic waste. It is equipped with advanced sensors and cameras that enable it to detect and identify different types of debris. The boat then uses its robotic arms to pick up the trash and store it in its onboard storage unit.

AI Artificial Intelligence Techniques −

The Robotic Trash Collector Boat uses a combination of Artificial Intelligence (AI) techniques to navigate through the water and collect trash. It has a sophisticated algorithm that enables it to detect and avoid obstacles, such as other boats or marine life. It also has a machine learning system that allows it to learn from its

environment and improve its performance over time.

One of the key AI features of the boat is its ability to identify different types of debris. It uses computer vision to analyse the objects in the water and determine whether they are plastic waste or not. This helps the boat to focus on collecting only the trash that is harmful to the environment.

Fig -1 : Arduino uno

This Tamper Detection Device is custom designed both in terms of shape and size as well as the electronics and the hardware are embedded on a custom PCB. This outer casing of this device is totally 3D Printed. The device is easy to install and portable and it has a long battery life, however it is also rechargeable. This Tamper Detection Device is directly connected to the battery.

Fig -2 : Ultrasonic Sensor

The important components used to make this device are Arduino uno, Ultrasonic sensor , Bo-motor ,PCB , Motor Drive shield . These

components play a key role in the functioning of the ROBOTIC TRASH COLLECTOR BOAT , which makes it very easy to use.

WORKING MODEL –

Mechanical setup:-The mechanical system for this is a boat type system with a bingo collect the trash. Mechanical robotic arm will be there to pickup the floating trash .

Electrical setup:-Here a DC battery is used down to drive the entire system. In additional toe this a solar panel is used for a battery backup.
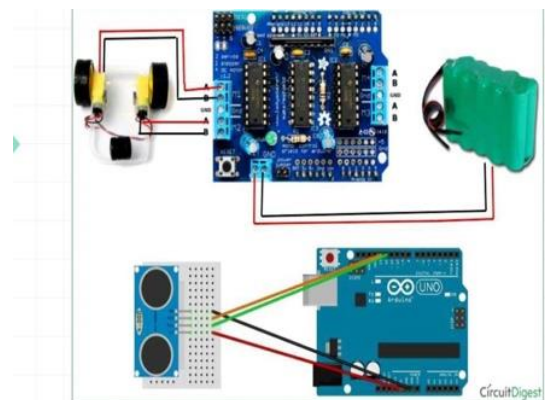

Fig -3 : Circuit diagram

To carry out the trash compaction, the robot should be able to identify the trashcan, fit in it, activate the hydraulic actuator, return the actuator, disengage from the trashcan and move towards another trashcan. In order to prevent the robot to rise during the compression process, it was placed a rod at the base of the robot structure that fixed up properly in the trash basis.
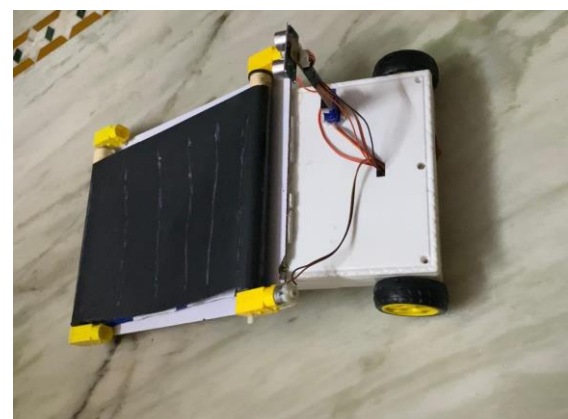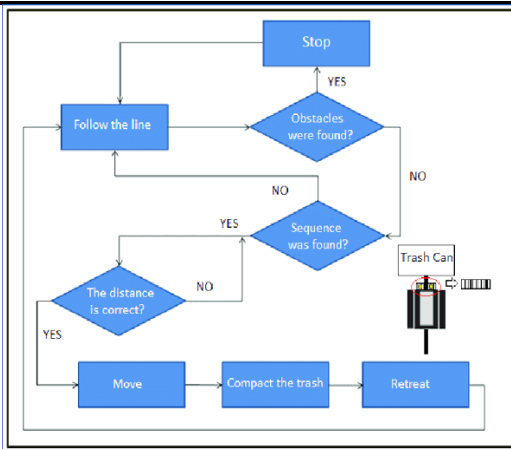

Fig -4 : Working Unit

Fig -5 : Flow chart

illustrates the coupling detail between the base of the robot structure and the basis of the trash.

Advantages of the system –

This cleaning system is easy to operate. This system is cost-effective and easy to replace and fix the problems. in this there isa reduction of the labour and life of many labour's would be saved. This will be an light weight portable machine and this requires only less power. Here a large amount of garbage will be collected and given for recycling.

Environmental Benefits –

The Robotic Trash Collector Boat has several environmental benefits. First and foremost, it helps to reduce the amount of plastic waste in the ocean. This is important because plastic pollution can harm marine life and disrupt entire ecosystems. By removing this waste, the boat helps to protect the environment and preserve the natural balance of the ocean.

In addition to collecting trash, the boat also has a built-in system for sorting and recycling the waste. This means that the plastic collected by the boat can be reused and repurposed, rather than ending up in landfills or the ocean. This not only reduces the amount of waste in the environment but also conserves resources and reduces greenhouse gas emissions.

Challenges and Limitations –

While the Robotic Trash Collector Boat is an innovative solution to the problem of plastic pollution, it does have some limitations. One of the biggest challenges is its ability to operate in rough seas and adverse weather conditions.

The boat is designed to operate in calm waters, and it may struggle to collect trash in more challenging environments.

Another limitation of the boat is its cost. The technology used in the boat is still relatively new and expensive, which means that it may not be feasible for widespread use at this time. However, as the technology continues to develop and become more affordable, we may see more boats like this being deployed around the world.

RESULT –

Floating trash are more common problem in the urban Areas. This trash would block down the place and because of that overflow of drainage water in that area will tend to be occurring out. And not only that this stagnant water will produce out more mosquito's larvae. theses drainage water will cause down a major health effects to the peoples. So, because of these important reasons these wastes must be removed out.

CONCLUSION –

In this the spreading up of the diseases will allows be reduced out. Due to poison gases in the drain many workers are died out but while using this no such problems will arise out. Since this method uses down a high-end programming correct location of the floating objects will be found out. This robotic system is time save able, its portable device. This would be easy to afford and this consumes down less power. Here this system can be made down more effectively and because of that it can be widely used. These kinds of machines are automated with a high-end technology and from this system it's easy to clean drainages from the industries and also from the urban drains. For our

country like India this system will be more useful to clean the drainages as this would be more effective one. Drainage waste water control treated by this method will be helpful to irrigate the plants, to clean toilets. This robotic system will be more useful in the rainy seasons as drainage will be blocked easily in those reasons.

The proposed a framework that has effectively been executed. Through our proposed framework we also aim to significantly reduce costs and thereby we provide open entryways for versatile creation of self-sufficient cleaning robots in the market.

In future our robot can be improved in such a way that it can differentiates between static and dynamic objects. We can develop our project in such a way that the robot should have ability in identifying metallic and non-metallic objects.

We can also develop "Automatic Waste Segregator" sorts wastes into three different categories, namely metal, dry and the wet waste. Besides, the appropriation and improvement of the best highlights from existing advancement into a solitary incorporated framework makes it productive.

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