

River Cleaning Boat Using GPS and Arduino Uno

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ABSTRACT: Plastic, thermocol and metal usage contributing to water plugging, which is causing problems and promoting diseases like typhoid and intestinal illness. Manually cleaning the wastes would not be sufficient because it frequently entails a large amount of work and effort and there is a chance that the irresistible germs present in the sewage could cause various illnesses. This study includes a suggested design for a garbage collection system that is practical and efficient for cleaning up trash from rivers, channels, and lakes. The system for collecting trash is specifically designed to work with applications for picking up a variety of material, including gliding litter, trash bags, discarded tires, and others. GPS technology which has the ability to track the entire process is utilized as part of the integrated system. The watercraft was developed in response to the need for cleaning contaminants in the rivers territory and to meet the requirement of working in locations other than the seaward zone, providing more options for the use of cleaning trash and waste from the aquatic environment. This abstract presents a conceptual framework for an advanced river cleaning boat system aimed at efficiently addressing the accumulation of debris and pollutants in rivers. This project emphasis on design and fabrication of the river waste cleaning machine. The work has done looking at the current situation of our national rivers which are dump with crore liters of sewage and loaded with pollutants, toxic materials, debris etc. The government of India has taken charge to clean rivers and invest huge capital in many river cleaning projects like "Navami Ganga", "Narmada Bachoo" and many major and medium projects in various cities like Ahmadabad, Varanasi etc. The collecting plate and chain drives are rotating continuously by the motor. The collecting plate is coupled between the two chain drives for collect the waste materials from river. The collected wastages are thrown on the collecting tray with the help of conveyer.

KEYWORDS: Wastage, Seaward, GPS, River.

I.INTRODUCTION: Water occupies about 71 percentage of the earth's surface and provides humans with a number of benefits. Water is indeed the backbone of human

civilization. From the beginning of human history, rivers and lakes have been supportive of our livelihoods. Even today, we are still dependent on the water bodies for our growth in every aspect. But with the growing industrialization, we have ignored the fact that we are not only using but also causing harm to natural resources. The water drainage system consists of waste materials that might be nonbiodegradable. The non – biodegradable wastes are a serious threat as they lead to climatic changes and floods. We must understand that saving and maintaining the resources for sustainable development becomes our responsibility. Decades of uncontrolled dumping have led to a lot of pollution already. It is time that we started cleaning up the mess we all have been making. Cleaning the water bodies to improve the water quality of rivers and lakes is the endeavor. Generally, manual methods are used to pick up the water debris, trash, plastic, and all other types of impurities that lie on the surface of water bodies.

II.EXISTING SYSTEM: Traditional method for collecting water surface floating waste is manual basis, by means of boat trash skimmer. The above methods are costly risky and large time consuming. To eliminate the drawbacks of the above-mentioned methods the remote- controlled

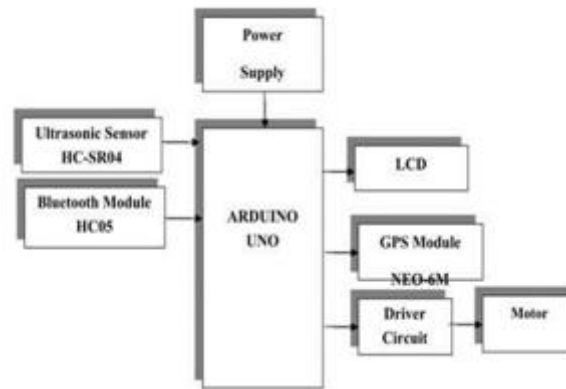
water cleaning machine was designed which helps in cleaning the water surface efficiently and eco-friendly. The statement of the project is “Robotic Pool Cleaning Machine Using Arduino” to remove the waste debris, plastic waste garbage from Rivers and pools. This causes harm to acoustic human life. To achieve clean water body for reduction of river pollution to achieve the beauty of water bodies by cleaning water bodies. To achieve that we require prior knowledge of either desired position or angle of each joint, where using the angels is called forward kinematic while using the position is called inverse kinematic. Specially designed boats equipped with tools and equipment for cleaning rivers and collecting debris. Nets, booms, skimmers, and conveyor belts are used to trap and collect floating debris. Some systems have onboard mechanisms to separate, sort, and process collected waste for recycling and proper disposal. Trained crew members operate the boat and manage the cleaning process, ensuring safety and GPS and other navigation tools help in efficient coverage of the Boats can be powered by traditional fuels or more environmentally friendly options like electric or solar .Some systems integrate sensors to monitor water quality and

pollution levels, providing insights for ongoing improvement. Public awareness campaigns and involvement encourage responsible waste disposal and reduce future .Coordination with local authorities, environmental organizations, and communities helps in effective planning .Regular upkeep of boats and equipment is crucial for smooth functioning Real-time monitoring and reporting Mini Project Report River Cleaning Boat using GPS and Arduino UNO systems help track progress and measure the impact of the cleaning efforts. These systems can be adapted to suit different river environments and pollution challenges.

III.PROPOSED SYSTEM:

A specialized mechanism to collect floating debris and trash from the surface of the water, equipped with nets, conveyor belts, or other suitable devices. Integration of sensors like GPS, cameras, and sonar to help the boat navigate efficiently and locate areas with higher concentrations of trash and pollutants. Sufficient storage capacity for the collected waste, along with mechanisms to compact or compress the trash to maximize the boat's efficiency. The effectiveness of the proposed system would depend on factors like the size and condition of the

river, the types of pollutants present, and the available budget and technology. The proposed system design employs sensors to record parameters such as the detection of obstacles. Based on the sensors readings, the boat is controlled for picking up the floating trashes in the water through conveyor belt. Sufficient storage capacity for the collected waste, along with mechanisms to compact or compress the trash to maximize the boat's efficiency. The system could work as follows: The boat's sensors continuously collect data about water quality, detect trash, and identify obstacles. The Arduino processes this data and makes decisions, like changing the boat's course to avoid obstacles or slowing down near trash. The GPS module logs the boat's path and location, helping to track cleaning progress. The communication module allows you to remotely check the boat's status and receive notifications. Data collected during cleaning missions can be stored for analysis and future improvements. Remember that building such a system requires a good understanding of electronics, programming, and integration. Make sure to consider safety precautions, waterproofing, and reliability to ensure the success of your river cleaning boat project.



3.1 PROPOSED BLOCK DIAGRAM

When the power on the boat is on, the Bluetooth module starts the data communication process. That is, data is communicated between the Bluetooth control app and the Bluetooth module. After, this data is sent to the Arduino UNO board through the Serial communication method. Then, the motors rotate according to that data. All these are done through the Arduino program. The robot is equipped with GPS and sensor that enables it to navigate autonomously and locate the areas that

require cleaning. The first two motors help the boat to move further. The robot's GPS technology and sensor system enable it to navigate and detect debris. While the belt which is rotating with the help of other two motors, efficiently gathers debris of various sizes.

IV.RESULTS:

This is the River Cleaning Boat using Arduino UNO and GPS which consists of the conveyor belt used to collect the trash by rotating continuously.



4.1 Hardware Setup

When the power is ON, the LED displays RIVER CLEANING SYSTEM as shown below.



4.2 Display

Using AMR_Voice app with the help of Bluetooth module in Boat, the boat follow the commands given from the mobile and follow accordingly.



4.3 Voice instruction indication

If the command given from mobile is *forward#, then the LED display as shown below and the boat moves forward.

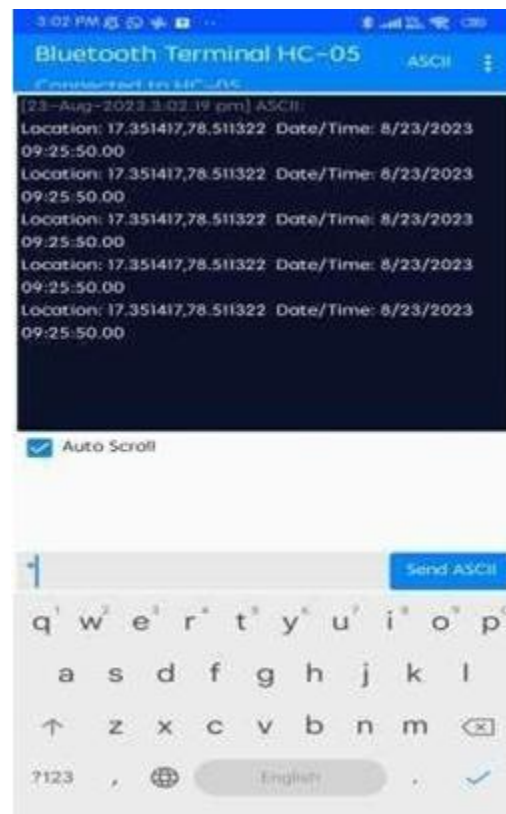


4.4 Forward indication

If the command given from mobile is *backward#, then the LED display as shown below and the boat moves backward.



4.5 Backward indications



4.6 Location identification

When the power is on the step down transformer converts 230 v AC to 0-12v and rectifier converters AC to pulsating DC, regulators smoothens the signal and gives to power supply which gives 5v to each component for the system operation. By using Arduino IDE the program is dumped into the Arduino UNO for the system

operation. Driver Circuit is interfaced with Arduino UNO for the working of the motors. Here 4 DC motors are used for the system operation. Two DC motors for boat directions and another two for rotating conveyor belt .GPS is used for the navigation of boat which gives latitude, longitude, date and time in the mobile by

using Bluetooth terminal HC05 app .LCD is used for displaying the directions like forwarded, backward, left, right, start, stop, debris is near and waiting for input which are instructed from Mobile using AMR_voice. By using Bluetooth Module HC05 module the data is communicated between the mobile app and Arduino UNO. There by, the floating debris is collected by using conveyor belt in the trash bin.

V.CONCLUSION: Cleaning of water bodies is always been a huge problem. Due to which the aquatic life of animals is destroying. So, to maintain a good balance between the aquatic life, this automatic water cleaning machine is introduced. This machine is easy in operations and its manufacturing cost is also low. Hence this water cleaning machine is very useful. Water cleaning machine is designed to make system very much economical and helpful to remove water impurities like plastic, trashes and other day to day waste which is floating on the surface of water bodies. This machine provides a new life to the aquatic animals and it also helps in human living. The Ro-boat was tested successfully in the Yamuna River in New Delhi, in the framework of the Ganges River action plan. The engineers who designed it estimate that 50 such devices would be capable of cleaning the

river 6 months. To increase the functionality of the device, various other modules can be added without affecting the present system. Among the various added functionalities, some could be voice detection, camera, screaming alarm, and shock generator.

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