

LAKE CLEANING ROBOT

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Introduction:

Clean water is a basic need for all living beings. Without water survival in the Earth is not possible. Water covers about 70% of the Earth's surface among that only 3% of that is pure water. Water gets polluted due to any reasons like industry waste, sewage waste, garbage waste. Hence it is important to maintain cleanliness and hygiene of water. We considered this water pollution as a serious issue and start to work on the project. We decided to incorporate technology to get the work done effectively and efficiently.

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 water waste cleaning Robot consists of Node MCU, DC motor battery pH sensor, Turbidity sensor, Ultrasonic sensor are attached to it for collecting the waste and monitoring the water.

Objectives:

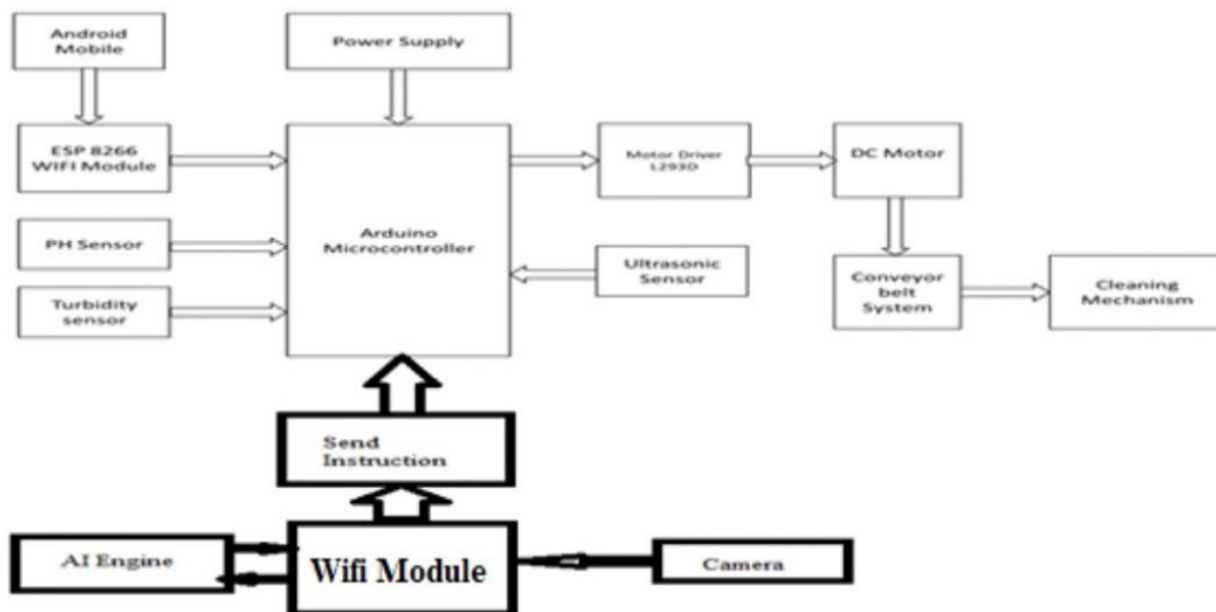
- Easy disposal of waste: Another important thing is easy removal of wastes which are collected in the collecting box.
- It must be stable: To make the product stable it must get through with proper design calculations. It should withstand extreme conditions such as additional load exerted by the water waves and as well as by the wastes which are being collected.
- Safety for the user: The product must be user friendly.
- Environmentally friendly: It should not harm the aquatic animals. It must not have any property that has adverse effect on the water source.
- Detect garbage in the water body using image processing.

- To detect any obstacle effaced by the vehicle, ultrasonic sensor is used, which will alert the user if any obstacle is on its path.

Methodology:

Materials: Arduino UNO Microcontroller, DC Motor, H-Bridge L298 Driver, Wi-Fi Camera, Ultrasonic Sensor, Battery, Node MCU

- Initial Setup:
The vehicle will be fitted with six dc motor. Two dc motor for movement of the vehicle and two dc motor will be used for cleaning the lake. Vehicle will have Arduino Uno micro controller which will be act as brain of the vehicle. Node MCU will be attach with the vehicle to communicate wirelessly and camera will be attached with raspberry pi to detect garbage using deep learning algorithm CNN.
- Set Instructions:
Various instruction will be sent to the vehicle using raspberry pi Wi-Fi. We will use android application to send instruction to the vehicle. The sensor connected to the vehicle will returned some analog values to the user.
- Execution:
In the execution phase when the vehicle is switched on it will start communication with user android device. It will respond to user instruction. When the user presses the start button, it will start automatic cleaning the lake. User can also manually control the vehicle by pressing the various button to move forward likewise backward.



Result and Conclusion:

- This project is emphasis to provide flexibility in operation. This is easy in operation and cost of maintenance is low. Hence this project “LAKE CLEANING MACHINE USING WIRELESS PROTOCOL” is mostly designed to make system very much economical and helpful to remove water impurities like plastics, trashes, water debris which is floating on river and pond surface.
- This is mainly very useful maintaining human health and for increasing the life of aquatic animals.
- This innovation is easy and less costly and has lot of room to grow more economical.
- On the basis of it design and estimating cost and availability it is very cheap and very useful for the society

Scope for future work:

Our future work focuses to improve the project by developing the robot to work in any water bodies like rivers, oceans, etc. Furthermore, the use of image processing to differentiate the wastes as biodegradable and non- biodegradable may also be implemented in future. This will help to protect the aquatic animals, thus maintaining a balanced ecosystem. The project can be further improved by adding a GPS and wireless communication capabilities to give information to respective authority about the place where the wastes are being stored.