



# Design and Controlling of River Cleaning System via IoT

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**Abstract:** This project focuses on “DESIGN AND CONTROLLING OF RIVER CLEANING SYSTEM VIA IoT”. In India pollution is increasing day by day therefore this can be changing into major problem for rivers, ponds etc. This principally contains impurities like waste water debris, plastics, garbage on floating water surface. These impurities principally have an effect on health of soul and conjointly have an effect on lifetime of aquatic animals. The integrated system incorporates the usage of IOT technology that has the flexibility to watch and management the complete method. From the interest and wish of clean-up contaminations within the conduits territory, the vessel has been created to suit the requirement of functioning at places aside from seaward zone, giving a lot of choices for the use of clean-up garbage and waste from the water atmosphere.

In this topic we tend to are attempting to form a watercourse clean-up machine which may be utilised simply to clean-up the rivers of our country like Ganga, we've took this subject from the conception of Namami Gange project of India.

## 1. INTRODUCTION

Generally, conventional method based on manual basis and it is used for collection of water debris, trash, plastic and all other types of impurities which is floating on water bodies or by collecting this impurity by means of boat, trash skimmer etc. And removed this impurity near river shore and disposed it. But this conventional method requires more manpower; hence this is risky, costly and time consuming method. By considering this all remote operated floating river cleaning machine is more efficient than Conventional method and also this is effective and eco-friendly.

This machine is remote operated so manpower does not required at all. So this machine is really advantageous for reducing the water pollution on Ganga river which is caused by ‘Kumbhmela’ And also Government of India has taken charge to clean river and pond due to increasing water pollution, and so that they invest huge capital for many river cleaning project like ‘Namami Ganga’, ‘Narmada bachao’ and also developed many project in various cities like Prayagraj, Varanasi etc.

## 2. OBJECTIVES

- To design a water cleaning model.
- To interface the functioning of model with IOT.
- To fabricate a water cleaning prototype.
- To use solar energy to operate prototype.

### 3. LITERATURE REVIEW

#### 3.1 Design and Fabrication of Remote Controlled Sewage Cleaning Machine

By *M. Mohamed Idhris*

The motive of the project is to automatize the waste product improvement method in avoidance, to cut back on the spreading of diseases to humans. The black water improvement method helps to forestall pestered infestations by reducing the residues which will attract and support pests.

It additionally improves the period and sensory quality of food products. Within the planned system, the machine is operated with a remote to wash the waste product.

Hence, this technique avoids the impacts of waste product waste and its harmful gases. This helps to forestall the dipterous insect generation from the wastage. The system incorporates an electric motor that starts running as presently because the set-up is switched on.

#### 3.2 Design and Fabrication of River Waste Collector

By *Adarsh Dorlikar*

This project emphasis on design and fabrication of the river waste cleaning machine. "River cleaning machine" a machine which involves the removing the waste debris from water surface and safely dispose from the water body.

The work has done looking at the current situation of our national rivers which are dump with crore litres of sewage and loaded with pollutants, toxic materials, debris etc. Due to increase in water pollution in the form to waste debris; it is hampering the life of aquatic animal and make their life in danger.

A machine will lift the waste surface debris from the water bodies, this will ultimately result in reduction of water pollution and lastly the aquatic animal's death to these problems will be reduced.

The main aim of the project is to reduce the man power, time consumption for cleaning the river. In this project we have store the energy in the battery and used this energy for river cleaning with the help of a motor and chain drive arrangement.

#### 3.3 Efficient Lake Garbage Collector by Using Pedal Operated Boat

By *Akash Dambhare*

The main motive is to clean the lake water for that purpose we are making efficient lake garbage collector by using pedal operated boat. In this, use of pedal operated boat with the conveyor attached to it for collecting garbage from the lake. Several companies offer equipment to garbage out of river lakes and harbours

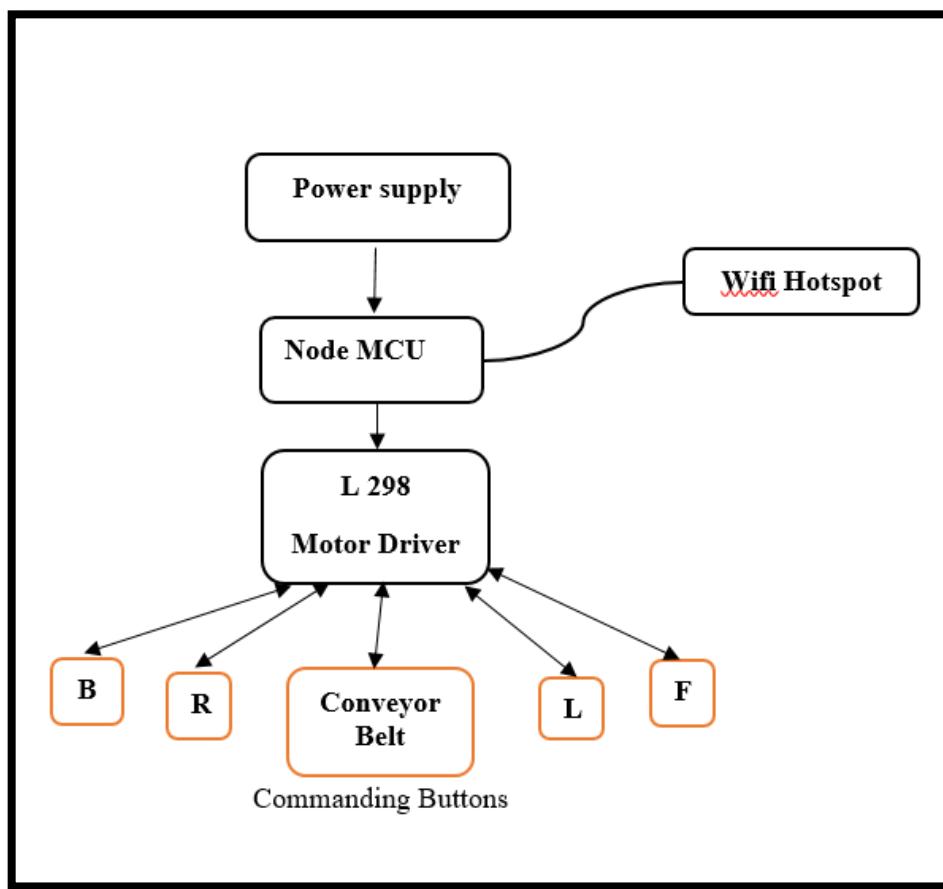
The water surface trash collection boat can work in river or lake, it can collect the floating garbage and some other equipment for weed cutting, and it harvest the aquatic weed from lake.

### 4. APPLICATIONS:

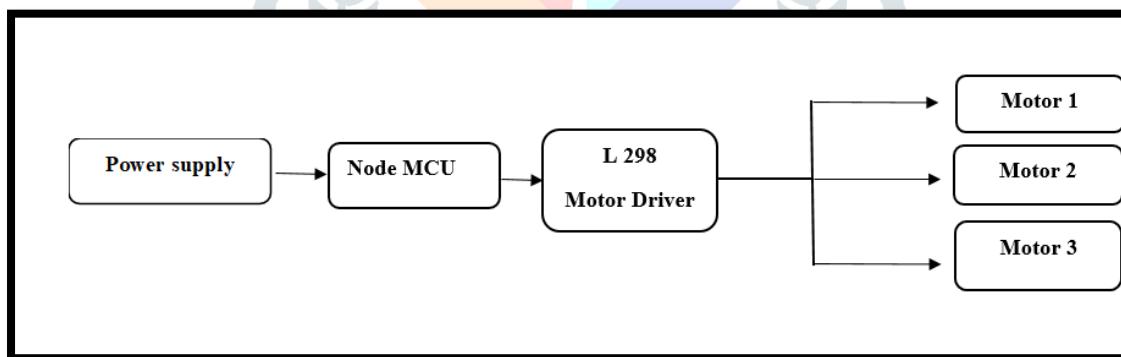
The application of the system are as follows:

- Applicable in sewage and gutter clean-up.
- Applicable in cleaning watercourse, etc.
- This machine is principally employed in improvement water system.
- The project is economical and can be used in remote place with less space for manuverability.
- It is applicable to remove water debris, impurities, and every one variety of impurities that are floating on water surface.
- Useful to reduce the reduce water pollution.
- It is deployed in work plant to gather dead fishes that float on the surface of water.

## 5. BLOCK DIAGRAM:



*Fig.1. Schematic Diagram of the prototype.*



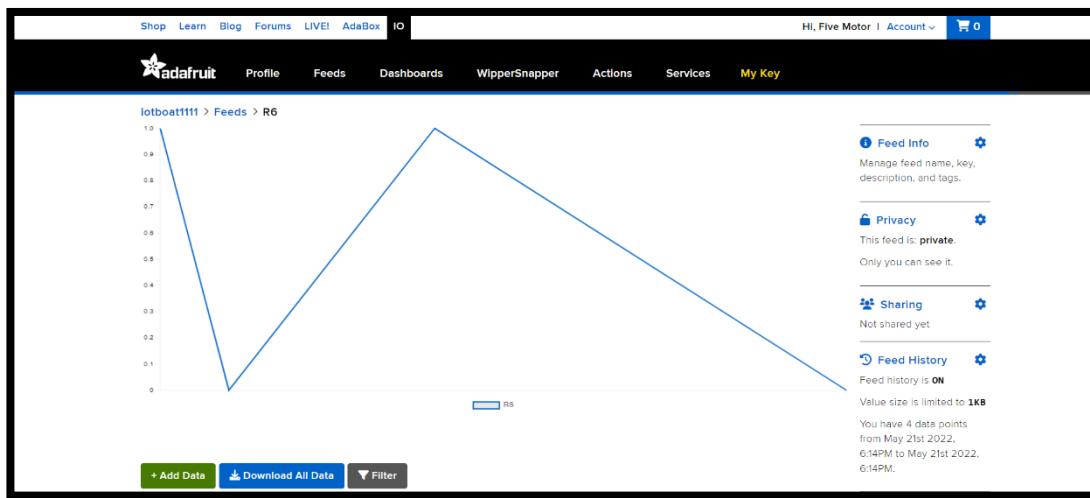
*Fig.2. Receiver side motor driver.*

## 6. SOFTWARE INTERFACE:



*Fig.3. Screenshot*

- The above picture is the screenshot of the actual Adafruit library homepage where all the controlling and movement of the prototype boat takes place
- In this, Start/Stop 3 is used to start and stop the conveyor belt movement in the backward direction with which it can pick up the trash from the water body.
- Start/Stop 2 is used to start and stop the rotatory motion of the blade cutters on either sides of the prototype.
- Start/Stop 1 is used to start and stop the propulsion of the turbines on the either sides.
- S button is used to stop all the working components together which acts a master switch.
- R button is used for backward or reverse movement of the conveyor belt.
- F button is used for forward movement of the boat turbine in forward direction.



*Fig.4. Screenshot of feed*

In this figure we can see how the forward motion has been tabulated in the form of a graph. This data can also be downloaded in the form of excel file for research purpose and it appears in the following form.

	A	B	C	D	E	F	G
1	id	value	feed_id	created_at	lat	lon	ele
2	OF1417K9SE7W1	1	1826199	2022-05-21 12:44:24 UTC			
3	OF1417KFE7JAQ	0	1826199	2022-05-21 12:44:25 UTC			
4	OF1417MGGH1F	1	1826199	2022-05-21 12:44:28 UTC			
5	OF1417P86BSAQ	0	1826199	2022-05-21 12:44:34 UTC			
6							

*Fig.5. Screenshot of tabulated data.*

This is a very fruitful part of our project as we have the ability to tabulate the data. This can be effectively used in K-Nearest Neighbors (KNN) algorithm and can be applied to classification and regression problems.

Artificial Intelligence algorithm can be also used in future to make the prototype self-sufficient and self-reliant. It means that the prototype can work on its own without any human intervention.

## 7. FEATURES:

- The river cleaning system incorporates the Internet of things technology easily.
- The boat also has solar power supply which continuously powers the rechargeable battery.
- The use of Mosfet in the motor driver cools down the temperature of the component and increases its longevity.
- The lightweight and streamline design of the body of the boat makes it easily maneuverable in the water body.

- The prototype will be monitored by wireless devices such as mobile phones, tablets and laptop for its movement in different directions.

## 8. CONCLUSIONS:

The following conclusions can be drawn from the project:

- The system which we created here will bring newer heights in the river cleaning technology.
- On the basis of the design, estimated cost and availability it is very cheap and very useful for the society.
- It will support the government projects such as '*Narmada Bachao*' and '*Namami Gange*'

## 9. FUTURE COPE:

- This project has broad scope in future since it saves lot of man-power.
- Also, by increasing our capital in this field and by technical advancements we can increase the range and size of the prototype which would do wonders.
- Artificial Intelligence algorithm can be also used in future to make the prototype self-sufficient and self-reliant.

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