POSEIDON : SURFACE WATER GARBAGE COLLECTOR

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Abstract

Increased water pollution has had a negative impact on marine flora and fauna, as evidenced by the extensive coral reef damage, declining aquatic life populations, and extinction of several species. Concerned authorities have taken action to control the problem and stop it from growing worse, although widespread application has not yet been carried out. This is a little gesture on our part to support the cleaning campaign. This boat will be specifically made to remove all surface water waste from water bodies.

The boat will successfully clean the water body by collecting any trash in its course and storing it in its cavity, which will then be emptied manually on the land. Through the use of the custom-made Poseidon software, the boat will be able to change directions.

Thus, the primary goal of this remote-control boat is to maintain the cleanliness of the water bodies around. This is a little effort on our part towards a healthy and pollution-free environment.

1. Introduction

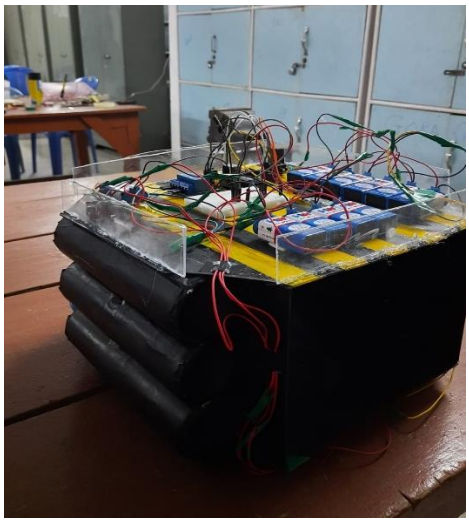
Water is a precious natural resource that is essential for all types of life on Earth. Despite having an abundance of water, water contamination is a serious problem in many nations. 80% of India's water sources are filthy, according to a global non-governmental organisation called "Water aid," which works to achieve fulfilment in hygiene and water sanitation. Water bodies are being contaminated by floating trash, weeds, debris, plastic, sewage, effluents, and hazardous industrial waste. In emerging nations, water contamination as a result of floating trash has become a severe problem that requires rapid response.

Garbage, weeds and plastic wastes are polluting water supplies. For trash management and control, efficient garbage removal in water sources including lakes, ponds, and rivers is crucial. One of the primary issues for the development of smart cities and completing the objective of a cleaner India in India is the management and control of aquatic waste. As a result, the goal of this effort is to develop a scientific method to address the issue of water waste disposal.

Our project is a model for a potential futuristic boat that would be used to remove garbage off the surface of a water body. This boat is powered by Arduino and is designed to gather trash from the water's surface that builds up in a net attached to it. Pumps have been employed to steer the boat in the right direction for

thorough cleaning. Through a virtual program, we were able to manually steer our boat. Reviewing the outcomes demonstrates that the project may be utilized to remove garbage off the water's surface in an efficient manner.

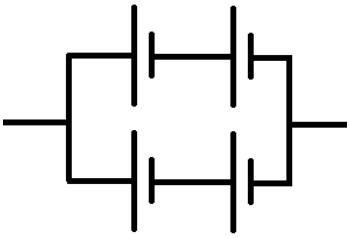
2. Description of the model



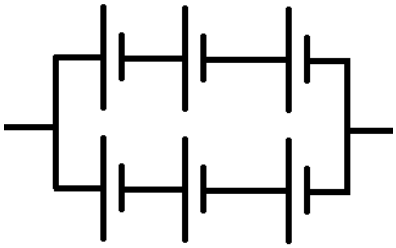
The main materials we used to build the boat's framework were acrylic sheets and aluminium alloy cans. Sixaluminium alloy cans with two joined from end to end and then stacked on top of one another have united two parallel acrylic sheets on either side. The boat is around 30x 25 x 20cm in size. We utilized a total of 10 pumps, 2 switches, a 2-point relay, a blue-tooth module, Eleven 9V batteries, aArduino-Uno board, and a Breadboard.

- Four of the ten pumps we've used regulate the boat's sideways motion by placing them in pairs on either side. The boat's forward momentum is controlled by the remaining six.

- The Arduino uses a single battery. The side pumps are parallelly powered by four batteries connected as shown in Fig(1) and the front pumps are parallelly powered by the remaining six batteries connected as shown in Fig(2) so that each pump operates at 18V:

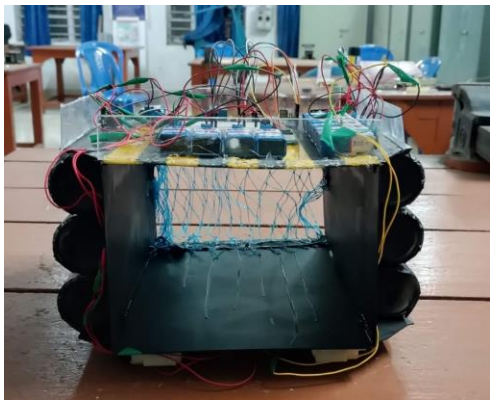


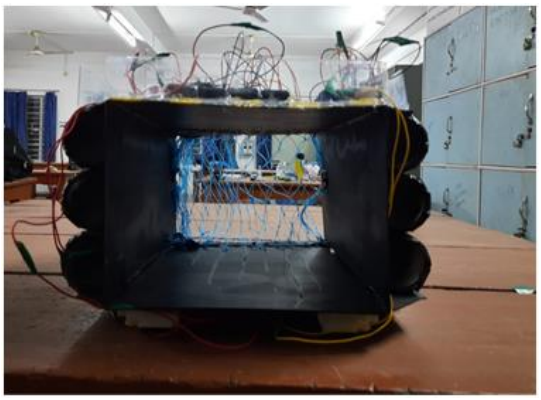
Fig(1)



Fig(2)

- The Arduino board is linked to the Bluetooth module. The relay is in charge of accepting signals from the Arduino to power the pumps.
- One switch activates the Arduino, and the other activates the pumps that propels the boat forward.





3. Arduino Code

```
char Incoming_value=0;
void setup() {
Serial.begin(9600);
pinMode(5, OUTPUT);
pinMode(6, OUTPUT);
digitalWrite(5, HIGH);
digitalWrite(6, HIGH);
}

void loop() {
  if(Serial.available()>0)
  {
```

```
Incoming_value=Serial.read();
Serial.print(Incoming_value);
Serial.print("\n");
   if(Incoming_value =='1')
digitalWrite(5, LOW);
   else if(Incoming_value =='2')
digitalWrite(5, HIGH);
   else if(Incoming_value =='3')
digitalWrite(6, LOW);
   else if(Incoming_value =='4')
digitalWrite(6, HIGH);
  }
}
```

4. Results and Applications

Poseidon is made to gather solid surface wastes from lakes, streams, ponds, and rivers, such as plastic bottles, food wrappers, metal cans, twigs, and other floating trash. However, this is really a scale model of a larger specimen that will eventually be used to clean large-scale waterbodies.
The framework's large storage space, which is restricted by a net at the back, would be used to load the gathered trash and convey it to the beach for safe disposal.

It moves through the water by swimming and gulping down anything that gets in its way. Anysmartphonemay control this robot using our software, and after it has fully returned to the base, it drops the garbage, which must be done manually.
The trash collector has a variety of pumps that provide free direction changes for the machine. One tap on the screen may complete the entire trash gathering and disposal operation.

5. Conclusion

Our water garbage collector prototype has shown that it can gather trash while submerged or floating on the water. It has been established via several trial settings that the smartphone app "Poseidon" can successfully manage the forward and sideways rotation of a water rubbish collector. It was able to collect up to 250g of trash in a 4.5 x 2.0meter swimming pool.

Future development of this water garbage collector might include autonomous navigation and a rubbish detecting system. Malaysia typically endures rainy days and floods from December to February, especially for those who live along the East Coast. By adopting highly durable and water-resistant materials for the collector body, this prototype may be further enhanced to fulfil the aim of avoiding the risk of flooding.

Using information from several publications and articles, this project's goal is to create a vessel that assists in collecting floating waste. The purpose of this boat is to remove aquatic detritus from bodies of water. Additionally, we may gather a variety of buoyant wastes such as plastic bottles, bags, and aquatic

plants without the assistance of any humans. Our initiative is a more cost-effective way to stop solid wastes from polluting waterways.