IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

SOLAR POWERED WATER TRASH COLLECTOR

[1] Ms.D. Venkata Lakshmi, [2]B. Ekthaamulya, [3]G. Sindhu,[4] V.S.S.S. Jayanth

[1]Asst.Professor, [2]Student, [3]Student,[4]Student

[1]Electronics and instrumentation engineering,

[1]Lakkireddy Balireddy college of Engineering, Myalavaram, India

Abstract: Most frequently, when someone hears the word "pollution," air pollution is the first thing that springs to mind. Non-biodegradable garbage in our water bodies is one of the pollution issues that receives the least attention and discussion worldwide. In India, a lot of plastic debris has accumulated on the surface of rivers and lakes. According to Sky News, the Ganga River is one of the 10 rivers that contribute to 90% of the plastic garbage that ends up in the ocean. Major incidences of local "nalos" and lakes becoming contaminated as a result of this debris have also been reported. This restricts the source of pure water, which causes significant water source depletion. Between 2001 and 2012, in Hyderabad, Lakes covering 3245 hectares disappeared. In southern New Delhi, the water level drops nine feet on average each year. Therefore, it is crucial to clean up these local rivers and waterways. The creation of a shore-wide water surface cleaning bot is what we're aiming for. The bot will find waste patches along the road and gather the trash, cleaning up the water bodies in the process. This method uses a surveillance system so that authorities can keep an eye out for anyone discovered contaminating water sources. Solar energy has been used to create a system that is more sustainable. The movement of the bot and shore surveillance are both monitored using a mobile application. This comprehensive remedy entails both preventive and curative measures that are required for water care.

Index Terms – Introduction, Components, Block diagram, Working, Result, References.

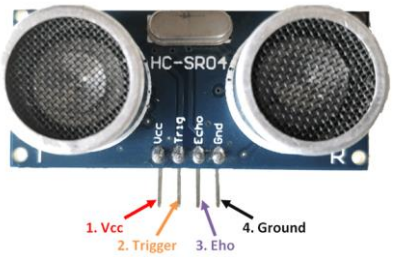
I. INTRODUCTION

Solar powered water trash collectors are designed to remove trash and other debris from water bodies using renewable energy sources. These systems can help to improve the health of aquatic ecosystems and protect wildlife by reducing the amount of plastic and other pollutants in the water. This document will provide an overview of how solar powered water trash collectors work and the benefits they can provide. A solar powered water trash collector typically consists of a floating platform with a series of barriers or booms that capture floating debris as it passes through the water. The platform is powered by one or more solar panels, which generate electricity to power the onboard motors and control systems. The system uses sensors and cameras to detect and monitor the trash in the water, allowing operators to control the collector remotely. As the platform moves through the water, the trash is captured by the barriers and directed to a collection bin or conveyor for removal. Solar powered water trash collectors help to remove plastic and other debris from water bodies, reducing the impact of pollution on aquatic ecosystems and wildlife.

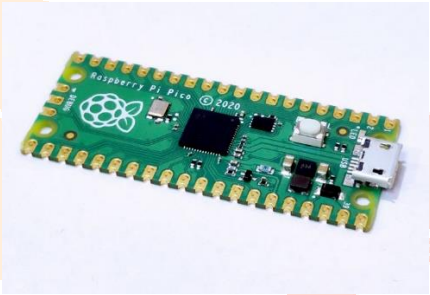
II. COMPONENTS

ULTRASONIC SENOSR: An ultrasonic sensor can be used in a solar powered water trash collector to measure the distance between the sensor and the surface of the water. Here are some details about ultrasonic sensors. Ultrasonic sensors use sound waves to measure distance, and can be used in a solar powered water trash collector to detect the level of the water in the container.

Distance = Speed × Time



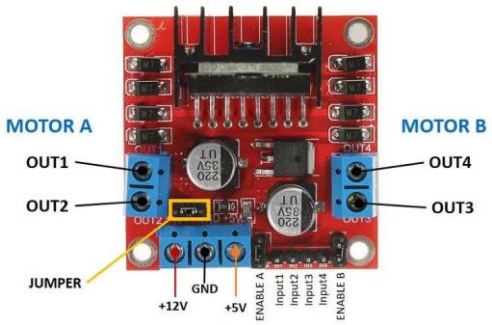
RASPBERRY PI PICO: The raspberry pi Pico is a low-cost, high-performance microcontroller that can be used in a variety of applications, including solar powered water trash collectors. The raspberry Pi Pico can be used as the control system for a solar powered water trash collector, providing real time monitoring and control of the system, and communicate with others devices, such as remote-control panel. It can run a 5v power supply and has a built-in sleep mode to conserve power when not in use. It can be programmed using a variety of programming languages, including micro python and c/c ++.



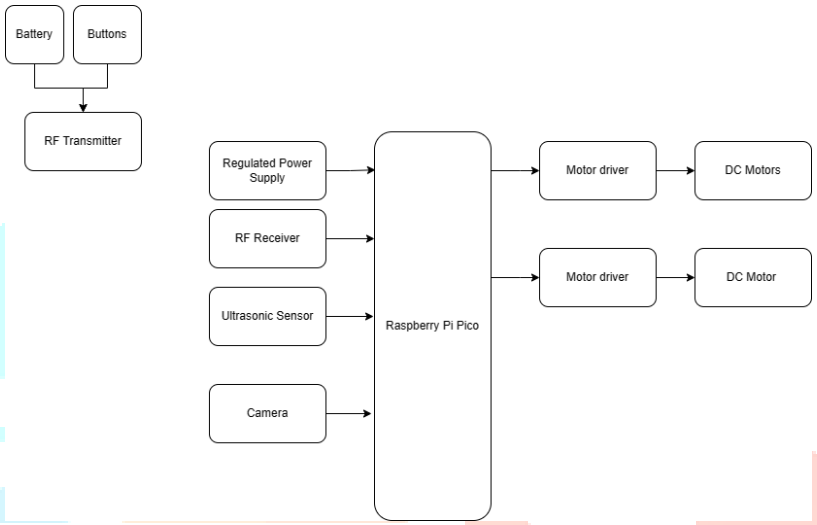
DC GEARBOX MOTOR: In a solar-powered water trash collector, the DC gearbox motor is typically used to drive a propeller or impeller that helps to move the collector through the water. The motor is connected to a solar panel that provides the DC power needed to operate the motor. The specifications of a DC gearbox motor used in a solar-powered water trash collector will depend on the specific application and design of the collector.

MOTOR DRIVER: The solar powered water trash collector uses a DC motor and an L298N motor driver for propulsion. The L298N is a dual H-bridge motor driver that allows for bidirectional control of two DC motors. It works by using pulse width modulation (PWM) to regulate the speed of the motor, and by switching the polarity of the voltage to control the direction of rotation. The motor driver receives its power from the same 12V lead acid battery that powers the motor. The L298N is controlled by the Raspberry Pi Pico microcontroller using four GPIO pins that are connected to the motor driver's input pins. By sending specific signals to these

pins, the Pico can control the speed and direction of the motor. This allows the robot to move forward, backward, and turn left or right as required for effective garbage collection.



III. BLOCK DIAGRAM:



IV. Working:

The system consists of several components, including a power system assembly for sustainable power supply, a conveyor belt for garbage collection and disposal, and navigation. The power system is designed to draw electricity from solar panels under typical circumstances. The solar panels power the motor and charge a lead acid battery. When solar power is not available, the system switches to use the battery's stored energy to start the motor. The conveyor belt is used to collect the garbage and move it to a disposal area. The system is designed to be environmentally friendly, so the collected garbage can be disposed of in an eco-friendly manner. The conveyor belt system is automated, so it can be programmed to stop once the garbage has been fully collected. The navigation system allows the collector to navigate through water bodies and collect garbage effectively. It uses a GPS system to guide the collector through the water, and an obstacle avoidance system ensures that the collector avoids obstacles along the way.

V. RESULT:

The proposed approach to water care consists of two components: proactive and reactive. The entire system includes a bot deployed on the water, and mobile devices used by local authorities, providing an end-to-end ecosystem for water care. The virtual fence is a novel concept, which detects human movement through wireless video surveillance with high accuracy.

VI. CONCLUSION: The proposed solution for preserving water bodies in an eco-friendly manner involves a solar-powered cleaning robot for the water surface. The use of open-source technology ensures that the code base is modern and cost-effective. The solution is comprised of proactive and reactive components. To effectively collect waste from larger water bodies, the robot may need to be increased in size and vertically scaled. Depending on the size of the water body, multiple robots may need to be deployed. After deployment, it is important to regularly monitor the power supply and make necessary adjustments to optimize efficiency.

VII. REFERENCES:

- National Mission for Clean Ganga (NMCG), G., 2021. [online] National Mission for Clean Ganga (NMCG), Ministry of Jal Shakti, Department of Water Resources, River Development & Ganga Rejuvenation, Government of India. Available at: https://nmcg.nic.in/NamamiGanga.aspx
- A. Sinha, P. Bhardwaj, B. Vaibhav, and N.Mohammad, "Research and development ofRo-boat: an autonomous river cleaning robot,"NASA/ADS.[Online]. Available:https://ui.adsabs.harvard.edu/abs/2013SPIE.9025 E..0QS/abstract
- Bhatkhande, Ankita. "Mumbai Students Build Robot to Help Clean Surface Water." DNA India,23 Mar. 2017, https://www.dnaindia.com/india/report-mumbai-students-build-robot-to-help-clean-surface-water-2364246.
- "Trash skimming — Cleantech Infra," Cleantecinfra.com. [Online]. Available:https://www.cleantecinfra.com/trash-skimming.
- "Water Surface Cleaning Robot", R. Raghavi1, K. Varshini2, L. Kemba Devi3 [Online] Available:http://www.ijareeie.com/upload/2019/march/42_ NCIREST106.pdf