River Cleaning Robot Using Solar Power

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Abstract: - The world today faces major garbage crisis the product from rapid economic growth, overcrowding, poor urban planning, and corrosive corruption. This article presents arduino based totally River Cleaning Robot. It is the robotic which floats on the water and the energy is supplied from 12V battery. The important purpose of the project is to reduce the manpower, time intake for cleaning the river. For that cause we designed the automated robot for river cleaning. The outcomes of robot performance were found that the robot arm and the conveyor belt can collect the garbage from the river for ex. Glass bottles, plastic waste, etc. at the surface of the river.

Keyword- *Motor, Conveyor, Robot, Garbage.*

I. INTRODUCTION

Lakes are an important feature of the Earth landscape. They are mostly valuable ecosystems and provide a variety of goods and offerings to humankind. They are not best a sizeable supply of precious water, but extend treasured habitats to flowers and animals, moderate the hydrological intense events (drought and floods), have an impact on microclimate, beautify the classy splendour of the landscape and provide many recreational opportunities. Lakes have a special significance in India. Pollution for the closing decades, there has been an explosive increasing in the urban population without corresponding growth of civic centres such as adequate infrastructure for the disposal of waste. Hence, as an increasing number of people are migrating to cities the urban civic services are becoming less.

As a result, almost all urban water bodies in India are suffering because of pollutants and are used for disposing untreated nearby sewage and solid waste, and in many cases the water bodies have been in the end became landfills. Although, there may be a plethora of policies and acts for the safety and restoration of urban lakes and wetlands, urban water our bodies are in extremely in the poor condition. There numbers are declining rapidly. For instance, at the start of 1960s Bangalore had 262 lakes, now handiest 10 hold water. Similarly, in 2001, 137 lakes had been listed in Ahmadabad city, and over 65 were reported being already built over (Excreta Matters, 2012). In Delhi in 2010-11 to test the adjustments in three water bodies in closing 10 years the fame of forty-four lakes was ascertained and it was located that 21 out 44 lakes had been gone dry because of fast urbanization and falling water tables (Singh & Bhatnagar, 2012).

II. MOTIVATION AND AREA OF UTILITY

A. Motivation

For constantly growing the water pollution inside the lakes, ponds and all the others water resources that are come inside the human touch and beneficial to the people for lots reasons. This is the important issue for the human society that the water required for each and every motive to the human being must be safe, clean and without pollution. But the lack of the equipments and the coast of the pollution controlling equipments it's miles more difficult to easy the rivers and make it garbage and pollution free for the motive of the river cleaning robotic is designed.

B. Area of utility

Fig.1. Water pollution

- The primary awareness of this task is to make the river free from garbage and pollution.
- This module can be applied in rivers, ponds, lakes and all the water resources.

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III.   BLOCK DIAGRAM AND WORKING

A.   Component used

- ARDUINO UNO
- BLUETOOTH MODULE
- BATTERY
- SOLAR PANEL
- RELAY
- DC MOTORS
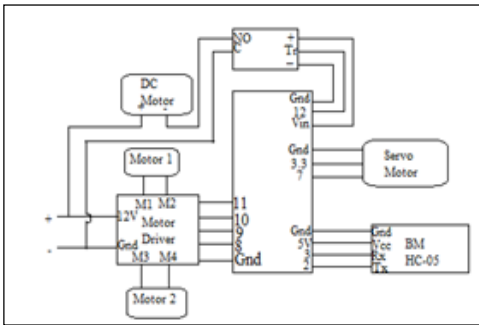- MOTOR DRIVE
- CONVEYOR BELT
- BO MOTOR
- SERVO MOTOR

Fig .2. Block Diagram

1)   Arduino Uno:

Arduino is an open-supply electronics platform primarily based on easy-to-use hardware and software. Arduino forums are able to observe inputs - light on a sensor, a finger on a button, or a Twitter message - and flip it into an output activating a motor, turning on an LED, publishing something online. To do so you use the Arduino programming language (based totally on Wiring), and the Arduino Software (IDE), based totally on Processing. Over the years Arduino has been the mind of plenty of projects, from ordinary gadgets to complicated scientific instruments.

A worldwide community of maker's students, hobbyists, artists, programmers, and professionals has accrued around this open-deliver platform, their contributions have brought as a good deal as a notable amount of accessible know-how that may be of wonderful assist to novices and specialists alike. Arduino have become born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed toward students without records in electronics and programming. As soon because it reached a much broader community, the Arduino board started out changing to conform to new dreams and challenges, differentiating its provide from easy 8-bit boards to products for IoT applications, wearable, 3-D printing, and embedded All

Arduino boards are absolutely open-supply, empowering customers to construct them independently and sooner or later adapt them to their specific needs. The software, too, is open supply, and it's miles developing via the contributions of customers worldwide.

Fig.3. Arduino Uno

2)   Bluetooth module:

The Bluetooth module HC-05 is a MASTER/SLAVE module. Bluetooth technology is an excessive speed low powered wireless technology link that is designed to connect phones or other network equipment together. It is a specification (IEEE 802.15.1) for the usage of low power radio communications to link telephones, computers and different network gadgets over quick distance without wires. Bluetooth is a standardized protocol for sending and receiving facts via a 2.4GHz wireless link. It's a stable protocol, and it's perfect for brief-range, low-energy, low-cost, wireless transmissions among electronic devices. These days it feels like the entirety is wireless, and Bluetooth is a big part of that wi-fi revolution. HC 05/06 works on serial communication. right here the android app is designed sending serial data to the Bluetooth module when sure button is pressed. The Bluetooth module at other end get hold of the data and send to ardunio via the TX pin of Bluetooth module (RX pin of arduino). The Code fed to arduino test the received data and compares. If received data is 1 the LED turns ON.

Fig.4. Bluetooth module

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3) Relay:

Switch, isolate, and make bigger indicators reliably Relays are used as interface modules. They carry out one of kind tasks depending on the version and are used to switch circuits on, off, and over. Switching gadgets that are susceptible to faults compromise the availability of machines and systems. Relay modules relay working concept Relays encompass three pins normally open pin, normally closed pin, common pin and coil. When coil powered on magnetic field is generated the contacts linked to each other. Relay modules 1-channel functions Contact contemporary 10A and 250V AC or 30V DC. .5V 10A relay module Description The relay module is an electrically operated switch that lets in you to show on or off a circuit the usage of voltage and modern day much.
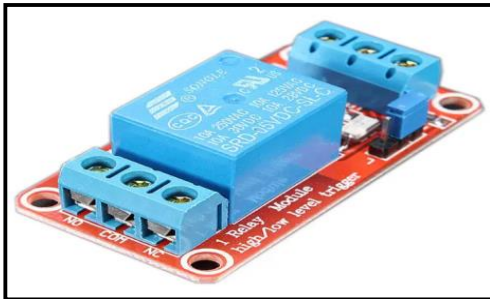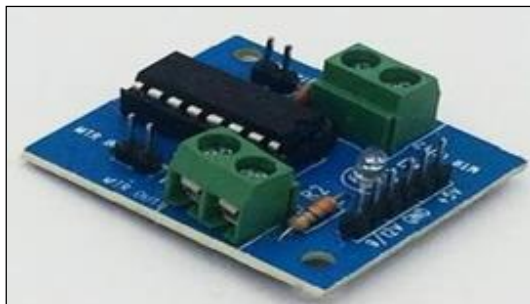

Fig.5. Relay
'

4) Motor drive:

Fig.6. Motor drive

A motor drive, inside the field of photography, is a powered film transport mechanism. Historically, film loading, advancing, and rewinding have been all manually driven functions. The goals of professional photographers for more green shooting, mainly in sports and wildlife photography, and the goals of newbie and newbie photographers for easier to apply cameras both drove the development of automatic film transport. Motor controllers may be manually, remotely or routinely operated.   They

may include best the method for starting and stopping the motor or they'll consist of other functions. An electric powered motor controller can be classified by means of the kind of motor it's far to drive, such as permanent magnet, servo, series, separately excited, and alternating current. A motor controller is connected to an energy source, inclusive of a battery percent or power supply, and control circuitry inside the form of analog or digital enter signals.

A small motor may be started out via absolutely connecting it to strength. A larger motor calls for a specialised switching unit called a motor starter or motor contactor. When energized, a direct on line (DOL) starter at once connects the motor terminals without delay to the electricity supply.

5) Bo motor:

Fig.7. Bo motor

DC motor (BO) Battery Operation. DC motor converts electrical power into mechanical energy. Why DC gear motor used in robotic Motor manipulate circuit. DC motor idea is in which gears lessen the speed of the automobile but increase its torque is called tools reduction. BO Series Motors Battery operated gear box motor from VIGOR PRECISION LTD (HK) are great for small battery operated robots. They can provide enough torque and pace at voltages as little as 3v. Motors are the actuators in numbers of products and projects. Robo India is offering almost every kind of motor. Customer may pick out one as in line with their requirement. Motor driver is the electronic circuit that is want to drive particular motor or to control one.

6) DC motor:

A DC motor is any of a category of rotary electrical motors that converts direct current electrical energy into mechanical energy. The most common types depend upon the forces produced through magnetic fields. Nearly all sorts of DC motor have some inner mechanism, both electromechanical or electronic, to periodically change the path of current in part of the motor DC motors have been the first form of motor extensively used, as they can be powered from present

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direct-current lighting energy distribution systems. A DC motor's speed can be managed over a wide range, using either a variable deliver voltage or by using changing the power of modern in its discipline windings. Small DC motors are utilized in gear, toys, and appliances. The universal motor can perform on direct cutting-edge but is a lightweight brushed motor used for portable energy tools and appliances. The creation of energy electronics has made replacement of DC motor with AC automobiles feasible in many applications. Small DC motor is utilized in tools, toys, and appliances. The universal motor can operate on direction.

Fig.8. DC motor

B. Working

The main aim of this device is to boost waste debris from the water floor and dispose them in the tray. It consists association of conveyor that's region on shaft of motor. Due to rotation of motor conveyor circled. As the conveyor is move, it accumulate water debris, waste garbage and plastics from water bodies. As the device is located inside the water the waste particles in water will get lifted and it actions in upward direction. As the waste debris reaches the upper intense position it will get dropped inside the tray. Hence this can result in cleansing of water surfaces and safe series of waste particles from water.

Propeller is used to power the machine at the river and run with assist of PMDC motor. By the usage of this four bar mechanism; it rotated at a particular attitude meant to gather the garbage for the version. It has window open and close as consumer wishes using far off to ON and OFF the mechanism. Water wheel is bolted on shaft that is placed on base frame. Motor is use to rotate the water wheel with the assist of chain force mechanism. In this venture tracking gadget is likewise implemented which is helpful to alter perspective of solar panel with recognize to sunrays. So that we get output of solar more.

In this studies work the main mission of this equipment is to dispose of the trash from the floor of the water of river and discard them within the tray. Here we are fabricating the river cleansing system which is far away operated. Working

Principle In trendy terms, the existing invention relates to a stationary, Solid waste Screening or skimming vessel for gathering waste from flowing waterways by way of the use of 4 exclusive varieties The Fins are connected with rod with the assist of hook at out of doors of the Boat. The flowing of water from Fins collects the floating stable waste. After collecting stable waste between Fins all the waste is transferred into Last section by way of lifting the fins with the help of Servo Motor. Fins are Hanging from one factor and another point is connected with metal twine and Metal wire is connected with Servo motor. defined herein, with the aid of a solid waste series system for gathering Solid waste in a body of flowing water that has a flotation platform adapted to being securely placed in and floating on the flowing water, a Solid waste series phase set up on the platform having, on one Two rod attached to and lengthening outward from the upstream give up of the platform used to connect the fins with Boat. This segment can be connected with boat the usage of hooks and if these packing containers are full of waste then it is able to be replaced with every other one or else by way of detaching the box this boat can be used for Transportation.
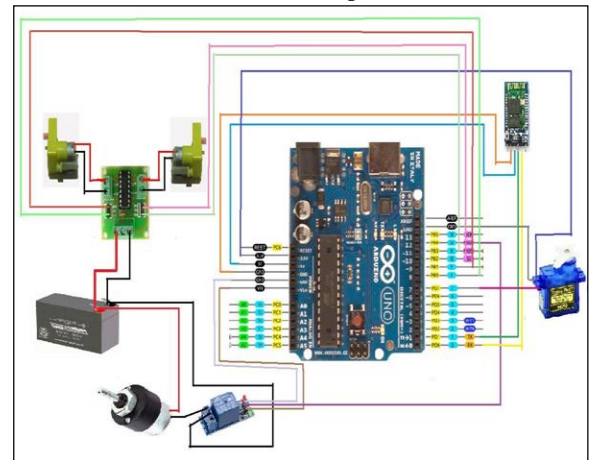

Fig.9. Circuit Diagram

IV. FUTURE WORK

The product can be used for plenty other functions in the destiny. It can be changed to throw existence jackets for the duration of rescue operations. This can be finished by fixing suitable propellers with better motor rpms. We can also replace battery with solar panels and make it completely work on solar energy. Technological advancement is one of the important factors, so that it will lead the future of humanity to prosperity and stability. This Water Cleaning mechanism is no one-of-a-kind from this fact as this system can similarly boost technologically. In this device we will use advance conveyor device and conveyor material for increasing the efficiency collection of garbage. We can use the solar panel

for providing energy to the boat as opposed to battery operation. To modify the size of boat consistent with its waste collecting potential is increases. This project makes only for small lake and by way of performing some amendment in its size and ability it can be used in large lake and river like Ganga.

V. Conclusion

we are able to conclude that it is an innovative technique of minimizing manual stress and therefore very much reliably stabilizing inside the river. The project executed via us made an impressing task inside the environmental purpose and it is very useful for the small scale works. Although this system in a position to collect the garbage from the lake with human intervention. The goal of the undertaking was efficaciously achieved. River cleansing robotic is designed with a goal of clean the water particles floating on the lake, through the use of our drone we are able to acquire many floating wastes like plastic bottles, bags, plants without any human interference and then dispose of the waste easily, one can smooth the lake simply by running it with the help of remote control. Also, our product assist in reducing the water pollution to a positive extent. The major advantage is the protection supplied by using our product that is one want no danger his life whilst he is cleaning the lake and we simply need one person to control the drone. The product is socially beneficial for the labourers who easy the lake and economically viable.

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