IMPROVING THE PREFORM EFFICIENCY OF VILLAGE POND CLEANER USING ARDUINO IN BASICS OF BLUETOOTH CONTROLLED PROCESSES

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Abstract:

Rapid technological improvements in various fields are impacting human life in many ways; nevertheless, technology must also be used to make life easier for humans. One of the main problems in wetlands and other bodies of water is water contamination. Marine animal life is being negatively impacted and is in danger of dying due to increased water contamination from waste debris. In a similar vein, some marine species accidentally eat surface waste debris, which causes the animal to perish. This research project has created a unique village pond cleaner model to implement modifications that will lessen water contamination. A village pond cleaner is a device that collects and securely disposes of waste particles that have been lifted from the water's surface. The village's pond cleaner employs Bluetooth technology to clear the pond of trash, plastic, and drainage debris. This machine's cleaning mechanism gathers and gets rid of trash and waste from various bodies of water. This lessens the difficulties involved in manually gathering contaminants. By removing waste surface detritus from water sources, a computer can lessen water contamination and the mortality rate of marine life. The belt drive mechanism of the suggested device is what extracts debris from the water. The goal of this initiative is to clear surface water detritus out of lakes, ponds, and other bodies of water.

I. Introduction

The source of life is water. Approximately 97% of the water on Earth is in the form of oceans, making it unfit for human consumption even though 70% of the planet is covered with water. The remaining 3% is kept in reserve in a variety of locations, including lakes, rivers, glaciers, and underground aquifers.

People are fed through the irrigation of their crops using river water. Rivers also bring prosperity and preserve the local nature. Regrettably, the majority of lakes and rivers are being contaminated. There are three categories for polluted water damage. They are known as grey water, black water, and clear water. A leaky tap or a broken water supply line are the sources of clean water. This water can become either grey or black depending on temperature, time, and interaction with nearby pollutants if it is not treated promptly. Sewage is disposed of by drainage pipes, and sadly, human life may occasionally be lost when clearing clogs in the drainage systems. Due to these several natural and man-made circumstances water gets polluted. With the help of the robotic arm, conveyer belt system, and cutting blades that are installed in our module, such agents will be effectively removed. As anticipated, cleaning is completed effectively with the aid of our main components: the automatic robotic arm, the conveyor system, and the rotating cutting blades.

Fig 1: Village Pond

II. Literature review

2.1 M. Mohammed Idris

In the proposed system, the machine is operated with remote control to clean the sewage. The system has a wiper motor that starts running as soon as the set-up is switched on. Two power window motors are connected to the wheel and it is driven with the help of the remote control set-up. The process starts collecting the sewage wastes by using the arm and it throws back the waste into the bin fixed in the machine at the bottom. An arm is used to lift the sewage and in turn a bucket is used to collect them. The setup runs even in sewage area with water (limited to a particular amount) so that the wastages which floats on the water surface also gets collected.

2.2 Mr. Abhijeet.M. Ballade

The proposed system explains that, 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. So that to reduce the water pollution we are trying to make river cleanup machine."River cleanup machine'' a machine which involves the removing the waste debris from water surface and safely dispose from the water body. The river cleanup machine works on hydropower to extract waste water debris, plastics & garbage from water.

2.3 Mr. P. M. Sirsat [3]

This paper emphasis on design and fabrication details of the river waste cleaning machine. This machine has designed to clean river water surface. The remote operated river cleaning machine has designed which helps in river surface cleaning effectively, efficiently and eco-friendly. The "River waste cleaning machine" is used where there is waste debris in the water body which are to be removed. This machine consists of DC motors, RF transmitter and receiver, propeller, PVC pipes and chain drive with the conveyor attached to it for collecting wastage, garbage & plastic wastages from water bodies.

2.4 Mr.Pankaj Singh Sirohi [4]

Have fabricated a river cleaning machine which makes of a turbine driven alternator to produce electricity. When water flowing in the river falls on turbine the turbine begins to rotate. The alternator generates electricity. This drives the vertical conveyor belt and horizontal conveyor belt through timing chains and sprockets. With the help of spur gears both the conveyor belts are connected with each other.

2.5 Mr. Prof. N.G. Jogi et al [5]

This paper emphasis on that mentioned that the Ganges in India is one of the most polluted rivers. About 29 crore litres of sewage is dumped in the Ganges along with toxins. They have suggested the usage of pedal operated boat with the conveyor attached to it for collecting garbage from the lake. With the help of this conveyor it is possible to collect the garbage like plastic bags, plastic bottles, beverage cans, food wrappers, paper bags, straws, (marine debris) etc. With this methodology no fuel is involved.

III. Working Principle

The conveyer system is used in this project to remove the waste trash that is floating on the surface. This is often accomplished by utilizing the controller to steer the rover across the water's surface such that the conveyer belt faces the waste. The belt-driven conveyer system used in this procedure collects the wastes from the water's surface. The blades are the primary tools used to remove the mature plants from the water's surface. The machine can generate enough torque to lift the mature shrubs from the water's surface thanks to the cutting blade motor's rotational force. The associated robotic arm will be used to clear away any vegetation or obstructions in the rover's way. Alternately, it can be utilized as a collecting agent to gather trash from water.
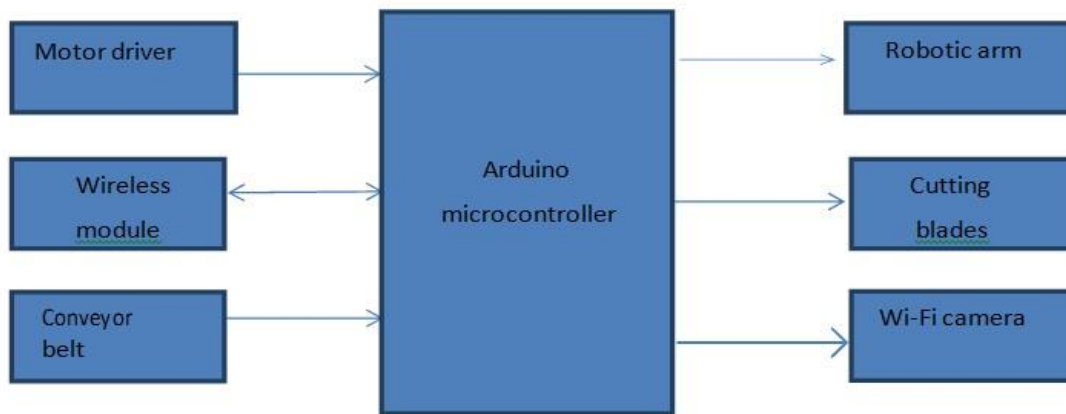
Fig 2: Block Diagram of Module

Sensors placed in the pond will collect data on pollutant levels, water quality, segment accumulation. The Arduino microcontroller will process this data and activate the appropriate cleaning mechanism accordingly. If the pollutant levels are high, the system may activate robotic arms to remove the pollutants effectively. The system will be equipped with Bluetooth technology to enable remote monitoring and control of the cleaning operations.

Users can connect to the system using a mobile application and receive real-time updates on the pond's condition. They can also control the cleaning mechanisms and adjust settings remotely, allowing for convenient management of the cleaning process. User-Friendly Mobile Application: The system will include a user-friendly mobile application that provides an intuitive interface for users to interact with the pond cleaner.

The application will display real-time sensor data, cleaning progress, and allow users to control the cleaning operations. It will also send notifications and alerts to users regarding any critical changes or issues with the pond. Optimization Algorithms: The system will incorporate optimization algorithms to maximize the efficiency of the cleaning process. These algorithms will consider factors such as the size of the pond, pollutant levels, and water flow patterns to determine the most effective cleaning strategy.

This optimization will ensure that the cleaning process is efficient, thorough, and tailored to the specific conditions of the pond. By implementing the proposed system, several benefits can be achieved: Improved Cleaning Efficiency: The automation and optimization provided by the Arduino-based system will result in a more efficient and thorough cleaning process.

Time and Labor Savings: By reducing the need for manual labor, the automated system saves a lot of time and labor. More frequent cleaning cycles and better pond care are possible because to the cleaning process' increased speed and efficiency. Improved Water Quality: The pond's water quality will be improved by the complete removal of contaminants and debris. This benefits the ecology, aquatic life, and the wellbeing of the neighborhood that depends on the pond for its water supply. Remote Monitoring & Control: The cleaning processes can be monitored and controlled remotely by the Bluetooth-enabled system. Users may easily check on the state of the pond from a distance, get real-time information, and change the cleaning parameters.

This improves convenience and enables prompt intervention when required. Making Decisions Based on Data: The system's sensor data collection offers useful information on the state of the pond. Users can use this information to plan maintenance cycles, enhance pond management overall, and make well-informed judgments about the cleaning procedure. In conclusion, the suggested technique provides a creative and effective way to clean village ponds. The system automates and improves the cleaning process with Arduino-based technology, Bluetooth control, and optimization algorithms, leading to greater efficiency, improved water quality, and practical remote monitoring and control.
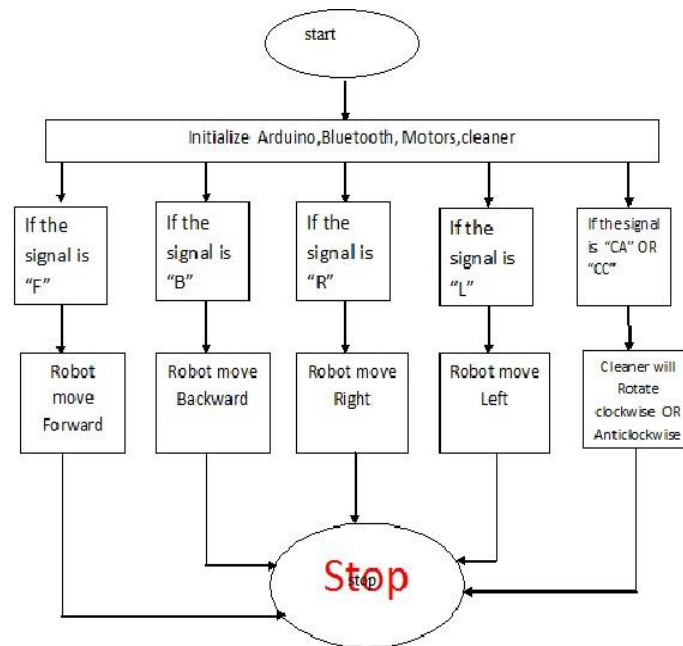
IV. Design flow

Fig 3: System Flow Chart

- Turn ON the power supply. After that all the components gets activated. In the next step Bluetooth module is opened and device gets connected with the Bluetooth. By opening this service UUID came on the screen.
- Once the byte stream mode is selected, it shows the keypad on the screen to give command. And we type forward to move the device forward. After checking the forward direction we moved on to check the backward direction. Then give the command as backward then robot will move backward.
- If we want to stop the device by moving, we can type 's'. By using this command we can stop the device. After stopping the device we it start again to collect the garbage at the right side. For that 'R' is given as a command.
- To collect the garbage at the left side we have to give the command to the device as 'L'. Then the robot will move left and collects the garbage. The garbage is collected when we give command as 'CA' to the device. Than the cleaner will collect the garbage in anticlockwise direction.

V.Conclusion

The issue of water logging brought on by plastic, paper, and metal encourages the proliferation of pests and makes diseases like malaria and typhoid more prevalent. This poses a threat to human life. The suggested approach reduces the need for fuel-operated garbage collectors while cleaning the trash found in both small and large lakes. Additionally, it helps aquatic animals live longer lives and requires fewer human efforts to keep the lake clean.

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