BLUETOOTH BASED POND CLEANING ROBOT

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ABSTRACT This paper explains India is holey country. There is lots of water pollution of Godavari River at Nashik. The water pollution is very important problem in rivers, ponds and water bodies near Godavari River at Nashik. 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. Similarly sometimes the aquatic animal tends to eats surface waste debris considering it as a food; which ultimately cause the death of animals. Due to polluted water is are many skin diseases to human kind are observed. So that to reduce the water pollution we are trying to make pond cleaning robot."Pond Cleaning Robot" a device which involves the removing the waste debris from water surface and safely dispose from the water body. The pond cleaning robot works on Bluetooth to extract waste water debris, plastics & garbage from Godavari River at Nashik. **Key Words:** Arduino UNO, Bluetooth module, DC motor, Motor driver etc.

INTRODUCTION The "Pond cleaning robot" used in that places where there is waste debris in the water body which are to be removed. This machine is consists of cleaner mechanism which collect & remove the wastage, garbage& from water bodies. This also reduce the difficulties which we face when collection of debris take place. 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. It consists of Belt drive mechanism which lifts the debris from the water. The use of this project will be made in rivers, ponds, lakes and other water bodies for to clean the surface water debris from bodies. Similarly they are lots of problems of water pollution under Godavari River, Nasik which affect the acoustic, human life & beauty of Godavari River.. Waste water is defined as the flow of used water from homes, business industries, commercial activities and institutions which are subjected to the treatment plants by a carefully designed and engineered network of pipes. The biggest impact of cleaning the chemical wastes can cause respiratory diseases and it plays a challenging issue for the municipality officers Water damage is classified as three types of contaminated water. They are clean water, gray water

and black water. Clean water is from a broken water supply line or leaking faucet. If not treated quickly, this water can turn into black water or gray water, depending on length of time, temperature, and contact with surrounding contaminants. Drainage pipes are used for the disposal of sewage and unfortunately sometimes there may be loss of human life while cleaning the blockages in the drainage pipes. The municipality workers are only responsible to ensure that the sewage is clean or not. Though they clean the ditches at the side of buildings, they can't clean in very wide sewages. The municipality workers need to get down into the sewage sludge to clean the wide sewage. It affects their health badly and also causes skin allergies

RELATED WORK

Namami Gange Programme [1] was launched by the Union Government, and includes sewage treatment, industry effluent monitoring. The objective was conservation, effective abatement of pollution, and rejuvenation of the national river Ganga. But it is not specifically focused on automated or controlled devices for river cleaning. A. Sinha et al. [2] proposed an unmanned ship Ro-Boat, which can detect, collect and remove debris, chemical sewage present on the surface autonomously. However, there is no provision for the security of bots in water. Robot SEARCh [3] is used to clean water bodies(specifically rivers), consisting of a raft-like structure made of PVC pipes and rubber. It has a conveyor belt that collects the garbage, but no power source mentioned, and collects it on the raft itself, weight constraints not mentioned. It is cheap, uses recycled materials to build the bot, but there is no controllability of the bot once it is put to action. Trash Skimmers [4] are equipment that helps remove floating waste from the river surface at popular ghats. It is a large-scale project for cleaning massive amounts of garbage. It does not segregate different types of trash, large and so cannot be equipped on every river or pond. R. Raghavi et al. [5] proposed a remote-controlled cleaning bot along with a pH sensor that determines the solubility and biological activity of the chemical constituents of water. The proposed work focuses on monitoring the water quality and also collects the garbage waste that is floating on the water surface. E Rahmawati et al [6] describe the design of a robot for cleaning rubbish floating on the water surface. They developed a pontoon-shaped hull that fulfills all the hydrostatic and structural

criteria of the boat. The hull can bear maximum trash of up to 16 kg. Siddhanna et al [7] proposed a robotic arm that can detect, pick, and place garbage from water bodies and thereby clean the water bodies. The proposed system is embedded with sensors for detecting obstacles and their respective distances from the boat and identifying whether the organisms are living or nonliving. Xiali Li et al [8] proposed a modified YOLO v3-based garbage detection method, allowing real-time and high-precision object detection in dynamic aquatic environments which enhanced the robot's performance. Lucia Maddalena et al [9] proposed an approach based on self-organization via artificial neural networks. Their work was useful for video surveillance systems like applications. Harsh Panwar et al [10] proposed a dataset called AquaTrash which is derived from the TACO data set. They then proposed a deep learning-based object detection model called AquaVision which classifies different pollutants that can be found floating on water bodies. Hsing-Cheng Chang et al [11] proposed a multi-function unmanned surface vehicle which has fourfold features - autonomous obstacle avoidance and navigation; water quality monitoring, sampling, and positioning; water surface detection and cleaning; and remote navigation control and real-time information display. M. N. Mohammed et al [12] proposed a design of a rubbish collection system. Arduino is used as the microcontroller for driving DC motors which draw power from solar energy and features ultrasonic sensors for distance measurement to the nearest obstacle. Xiahong Gao and Xijin Fu [13] proposed a miniature water surface garbage cleaning bot. STC12C5A60S2 controller is used along with WiFi for wireless control. A mobile app is developed to send instructions to the controller. A lightweight prototype is developed, but is restricted to a range of 20 meters and is not waterproofed. Akash et al. [14] proposed a machine in the paper that lifts debris from water surfaces and disposes of it within the tray that is inbuilt in the machine using a conveyor. The machine is manned using an RF transmitter and receiver that manage the remote remotely. It is easy to operate and flexible and uses a renewable source of energy. However, there is limited capacity to the tray that collects the garbage and only the waste that is floating on the surface of the water can be collected. S. S. Hari et al. [15] have proposed a bot that gathers the trash from lakes with the assistance of a transport line and stores it in the trash bin. By setting up an association with the Node-MCU board by utilizing Wi-Fi convention, the bot handles the direction of propellers which assists the robot with exploring

the water bodies. Having only one type of connection limits the use of bots in larger areas as the range cannot be manually extended from the point of operation. Jayashree et al. [16] aimed to design, develop and demonstrate a new open hardware and software technological platform to improve the monitoring of water bodies and assess their healthiness in real-time. The bots focus on increasing water health using the system of bots that work together interconnected using a radio system. The robots are connected to a land station that needs constant monitoring which compromises autonomy. Moreover, since the bots are manned underwater as well, if one of the bots goes missing, it is difficult to locate and remove the bot without physical labor. Soumya et al. [17] talk about "Pond Cleaning Robot", which involves removing waste debris from the water surface and disposing it safely. A bluetooth module and DC motors are interfaced with the microcontroller. LEDs are used to indicate the direction of the robot. Firdaus, D., Priambodo, B. & Jumaryadi, Y. [18] explained the process of using push notifications in Kotlin driven Android projects using Firebase, enabling the surveillance system created to send alert notifications to an android application when there is a possibility of someone polluting the water body. Ovidiu, Stan and Liviu Miclea [19] created a system similar to what we aim to implement. They have used a live camera feed from a Pi cam which has been hosted on port 8000 which can be accessed by the application using a RESTful API service.

M. Mohammed Idris [1] 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.

Mr. Abhijeet.M. Ballade [2] 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.

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.

PROPOSED DESIGN
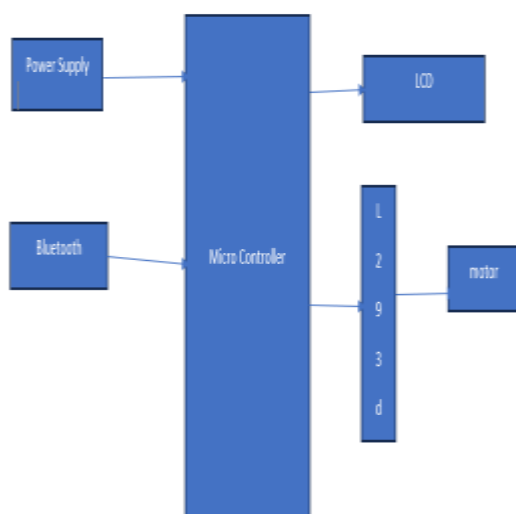
DC motor- 1 positive terminal is connected to pin-10 of Arduino and negative terminal is connected to pin -11 of Arduino. DC motor-2 positive terminal is connected to Arduino pin-9 and negative terminal is connected to Arduino pin-6. Two servo motors are use . One for performing sweeping operation and another one for performing the cleaning operation. It is controlled with Bluetooth via mobile phone. The servo motor-1 is coupled to the pin-5 of

Arduino, it turns ON, it will starts movement of the servo motor-1 along with the brushes. Brushes are used for sweeping the floor. So that the sweeping is performed. It can be moved in any angles like forward, backward and side wards. After completion of sweeping process. It will start cleaning process, it is based on servo motor-2. Fill the tub with water, the water pump which carries the water from the tub and spills it near the scrubber to mop the floor. Water pump is connected to the pin-12 of the Arduino The common ground wire from all the motors has to be coupled to the ground of microcontroller . And it starts the cleaning through the servo motor-2 The servo motor-2 is attached to pin-3 of Arduino The places which are very dark ,that can be cleaned ,we are using LED lights which are present on the robot once the work is done turn off the LED lights.

ADVANTAGES Man power is reduced due to automated self-service.

1. It is a non conventional and eco friendly system.

2. Since it is easy in operation skilled workers are not required.

3. Its maintenance cost is low. And the main advantage of this is it does not need much human intervention.

CONCLUSION The problem of water logging due to plastic, papers and metal leads to pest growth and it favors diseases like malaria, typhoid etc. This is unsafe for human life. The proposed system cleans the garbage present in small and big lake and minimizes the use of fuel operated garbage collector. It also saves the life of aquatic animal and reduces human efforts required to clean the lake.

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