BIONIC PERSON TO SCOOP WASTE ON WATER BODIES

S. Esakki Rajavel¹, Masanam R², Nisan Pranavah Raja³, Osborn Shantosh P⁴

¹Assistant Professor, Department of Electronics and Communication, Francis Xavier Engineering College, Vannarpettai, Tirunelveli, Tamilnadu 627003, India.
²,³,⁴UG Scholar, Department of Electronics and Communication Engineering, Francis Xavier Engineering College, Vannarpettai, Tirunelveli, Tamilnadu -627003, India.

ABSTRACT
Water is a basic need for all living being, it is important to maintain the cleanliness and hygiene of water. Water gets polluted due to many reasons such as waste from industry, garbage waste, sewage waste etc. water from lakes and ponds are cleaned by traditional methods. We have to incorporate technology such that cleaning work is done efficiently and effectively. We consider this as a serious problem and start to work on the project. We collected information from the various resources, based on the details collected we listed objectives that a design has to carry. Various concepts were generated through Pugh evaluation chart. Design calculation was being done where theoretical values of required parameters were calculated to match them with actual values achieved by the solution. A detailed engineering drawing is created and later fabrication process will be done stepwise.

Keywords: Waste scooping, lake, garbage, scooping

1. INTRODUCTION
Lakes are an important feature of the Earth’s landscape. They are extremely valuable ecosystems and provide a range of goods and services to humankind. They are not only a significant source of precious water, but extend valuable habitats to plants and animals, moderate the hydrological extreme events (drought and floods), influence microclimate, enhance the aesthetic beauty of the landscape and offer many recreational opportunities. For the last two decades, there has been an explosive increase in the urban population without corresponding expansion of civic facilities such as adequate infrastructure for the disposal of waste. Hence, as more and more people are migrating to cities the urban civic services are becoming less adequate. As a result, almost all urban water bodies in India are suffering because of pollution and are used for disposing untreated local sewage and solid waste, and in many cases the water bodies have been ultimately turned into landfills.
2. PROBLEM STATEMENT

In the absence of garbage disposal facilities, the practice of dumping garbage into nearby water bodies has become quite common in recent years and has posed long-term negative impacts both on biodiversity of the area and as well as on the local environment.

3. MOTIVATION

Our product should not be restricted to collect only one type waste. It must diversify its function to accomplish the given task. The mechanism made for to collecting wastes should be tough enough to collect plastic wastes, plastic bottles, organic wastes which include crop debris, food wastes & any type of wastes which is floating on water. The very basic idea should be satisfied that is to avoid the interference of the operator. This will happen only by the adoption and sustained usage of technology in the workspace. Very firstly it must collect around 5kg of waste at a time when it is being left to the water. Another important thing is easy removal of wastes which are collected in the collecting box. To make the product stable it must get through with proper design calculations. It should withstand extreme conditions such as additional load exerted by the water waves and as well as by the wastes which are being collected. The product must be user friendly. It should not harm the aquatic animals. It must not have any property that has adverse effect on the water source.

4. OBJECTIVES OF THE PROJECT

- To make the water surface clean
- To design a robot that replaces human force for cleaning floating waste.
- To detect the metal waste in depth of the water and pick it by extending its arm

4.1 Existing System

The “River cleanup machine” machine consists of waterwheel driven conveyer mechanism, which collect & remove the wastage, garbage & plastic wastages from water bodies. This also reduce the difficulties which we face when collection of debris take place. This 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.

4.2 Working Principle

The main aim of this machine is to lift the waste debris from the water surface and dispose them in the tray. Here we are fabricating the remote operated river cleaning machine. The collecting plate and chain drives are rotating continuously by the motor. The collecting plate is coupled between the two chain drives for collect the waste materials from river. The collected wastages are thrown on the collecting tray with the help of conveyer. Our project is having propeller which is used to drive the machine on the river. The propeller is run with the help of two PMDC motor. The total electrical device is controlled by RF transmitter and receiver which use to control the machine remotely

5. PROPOSED SYSTEM

In developing countries, growing amount of dry waste in canals, ponds, and lakes affect water drainage and life quality of residents living closed to those areas. Often found floating waste is such as plastic scraps, foams, tree leaves, and aluminum bottles. Accumulating of the dry waste floating on water surface can obstruct water drainage in city canals and cause floods. Water surface cleaning must therefore be done regularly. In this system,
nRF technology is used to handle the robot for collecting wastes in the water surface. User can give commands using the switches to the robot via nRF transmitter. Switches connected to the digital pins of the controller. It is used to move the robot forward and reverse, to collect the waste by the robotic arm. nRF connected to the TX and RX pin of the controller. Benefits of Proposed System are the battery capacity of the robot has been increased, It can withstand more than 2 hrs 30 minutes, It can scoop the underwater metal wastes, The scooping capacity has been increased.

5.1 Project Overview

In robot unit, nRF receiver connected to the UART port of RX and TX of the controller receives the data from the transmitter and send it to the controller. Controller will handle the robotic arm and the movement of the robot according the commands received which is given by the user. Relay is used to drive the dc motor according to the commands. A metal detector is an electronic instrument which detects the presence of metal nearby. We use an Inductive proximity sensor which operates under the electrical principle of inductance. Inductance is the phenomenon having a magnetic component, which induces an electromotive force (emf) in a target object. The inductive proximity sensor consists of four components such as coil, oscillator, detection circuit and output circuit. The oscillator is used to generate a fluctuating magnetic field around the coil that is placed in the device’s sensing face. When a metal object moves into the inductive proximity of sensors detection, Eddy circuits build up in the metallic object, magnetically push back, which is used to reduce the Inductive sensors own oscillation field. In remote unit, nRF transmitter connected to the UART port of RX and TX of the controller transmits the data from the transmitter and send it to the receiver. The robotic arm movement of the robot commands are transmitted which is given by the user.

5.2 Hardware Components

- Arduino Uno

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital
input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

- **nRF24L01**
  
  nRF24L01 is a single chip radio transceiver for the world wide 2.4 - 2.5 GHz ISM band. The transceiver consists of a fully integrated frequency synthesizer, a power amplifier, a crystal oscillator, a demodulator, modulator and Enhanced Shock Burst protocol engine. Output power, frequency channels, and protocol setup are easily programmable through a SPI interface. Current consumption is very low, only 9.0mA at an output power of -6dBm and 12.3mA in RX mode. Built-in Power Down and Standby modes makes power saving easily realizable.

- **Metal Proximity Sensor**
  
  LC Metal detector non-contact metal induction detection module used as a metal detector. When it approaches any metal in the water while cleaning by the waste scooping robot, it makes a sound and Digital output. This is a module specifically designed to detect metal. The module operates by inducing currents in metal objects and responding when it occurs.

- **Power Supply**
  
  The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

6. **CONCLUSION**

This project is fabricated on the basis of literature and research on different journal and paper relevantly available and fabricated in accordance so it can provide flexibility in operation. Modern services are becoming polarized. With the emergence of more and more automatic terminal services, modern services are also gradually becoming unmanned. Thus, this semi automated waste cleaning system helps in cleaning the wastes automatically and helps in decreasing the spread of diseases due to direct human intervention into the sewage. Since the system operation mainly depends on high level programming, it can be extended as per requirements. This system is time saving, portable, affordable, consumes less power and can be made easily available so that can use this system. The garbage was collected efficiently and effectively. This project “BIONIC PERSON TO SCOOP WASTE ON WATER BODIES” is designed with the hope that it is very much economical and helpful to river and Pond cleaning.

7. **REFERENCES**


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