

# AUTOMATIC BEACH CLEANING ROBOT

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**Abstract** - “It is a massive problem that affects everybody around the world,” said Alex Schulze, co-founder of 4ocean, a marine clean up company that removes a pound of trash from the beach for every product they sell, which includes apparel and accessories, so we are trying to solve this problem through our "Automatic ROBOT" which helps us to clean our beach and provide us healthy nature and also used for clean marine life, aquatic animals because they also deserve a better life. This robot is portable through this “AUTOMATIC ROBOT” there is no need for manpower use in beach cleaning. The Automatic ROBOT developed by 4ocean is a significant step towards addressing the issue of ocean pollution, as it offers several advantages over traditional manual beach cleaning methods. In addition to being portable, the robot is equipped with advanced sensors and technology that enable it to identify and collect different types of waste, including microplastics and other small debris that can be difficult to spot with the naked eye. This not only helps to ensure a more thorough and effective cleaning process but also minimizes the risk of human error and injury, as well as reducing the time and cost required for beach cleaning. Furthermore, by keeping our beaches and oceans clean, we can protect and preserve the natural habitats of marine life and aquatic animals, which are essential to the health and well-being of our planet.

The purpose of this paper is to present the development of a cutting-edge beach cleaning robot that utilizes advanced components, including an Arduino Uno board, flame sensor, GSM, wiper motor, DC clamp motor, cycle chain sprocket, 60rpm DC gear motor, L298 DC motor driver, Pedestal bearing UCP 204(20MM ID), and solar panel. Through the integration of these innovative technologies, the beach cleaning robot can function autonomously and effectively identify and remove various types of waste materials, such as plastics and metals, from the beach environment. This project is an essential step towards improving environmental sustainability and promoting eco-friendly practices in beach cleaning operations.

**Keywords** – Automatic Beach Cleaning Robot (ABCR), Internet of Things (IoT), Arduino Uno (AU).

## INTRODUCTION

In search of initiatives that benefit the environment and nature, we came across the idea of designing a robot to clean beaches. We observed that despite efforts to maintain cleanliness, our beaches remain cluttered and conventional cleaning devices are inadequate. To address this challenge, we have developed an automatic robot that efficiently collects and disposes of garbage. We have also incorporated advanced features into the robot to enhance its functionality. The idea of developing an Automatic ROBOT for cleaning beaches came from a realization that our environment and nature were being adversely affected by the increasing pollution of our oceans and beaches. We understood that manual beach cleaning methods were often inadequate and required significant manpower and resources. To address this problem, we decided to combine our technical skills and knowledge to develop an innovative solution that would be efficient, cost-effective, and eco-friendly. We spent months researching and designing the robot, incorporating advanced technology, sensors, and other features that would enable it to collect and dispose of different types of waste with ease. In addition, we made sure that the robot was portable, easy to operate, and could be used in a variety of beach settings. With the

development of this Automatic ROBOT, we hope to contribute to the global effort to protect and preserve our natural resources, and inspire others to take action towards a more sustainable future.

**METHODOLOGY**

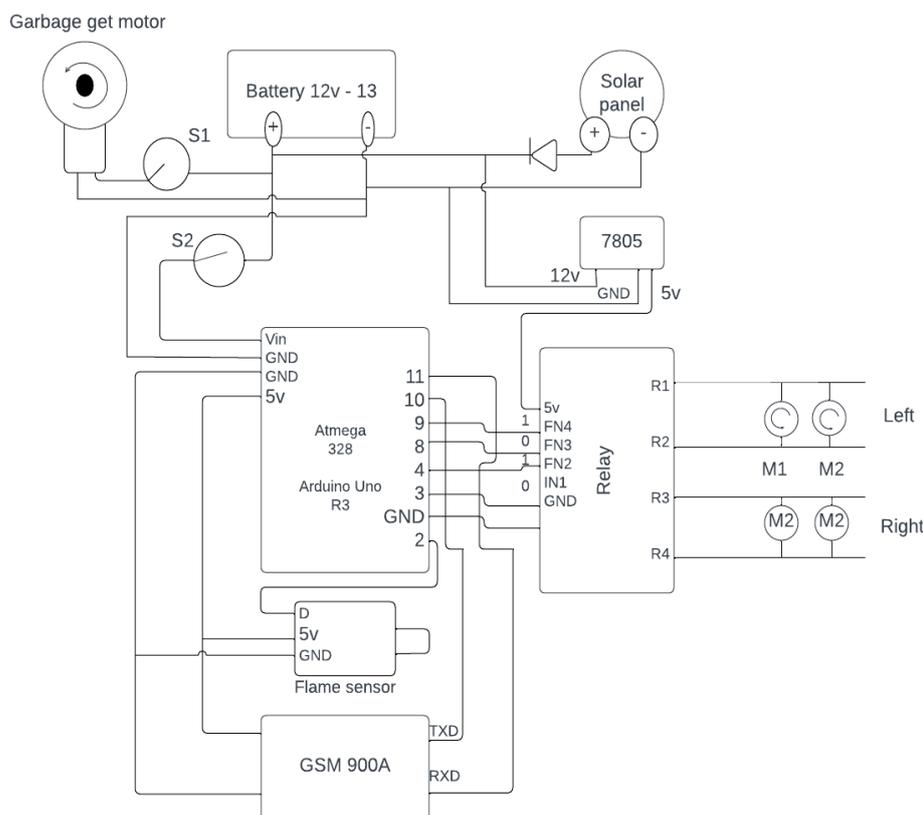


Fig 1. Circuit diagram

**Hardware Requirements**

Arduino Uno

Smoke sensor

Fire/flame sensor

Wiper motor

Dc motor clamp

Cycle chain sprocket

60rpm DC gear motor

L298 DC motor driver

Pedestal bearing UCP 204(20MM ID)

Solar panel

GSM

**Software Requirements**

Arduino IDE

Embedded

**Result**

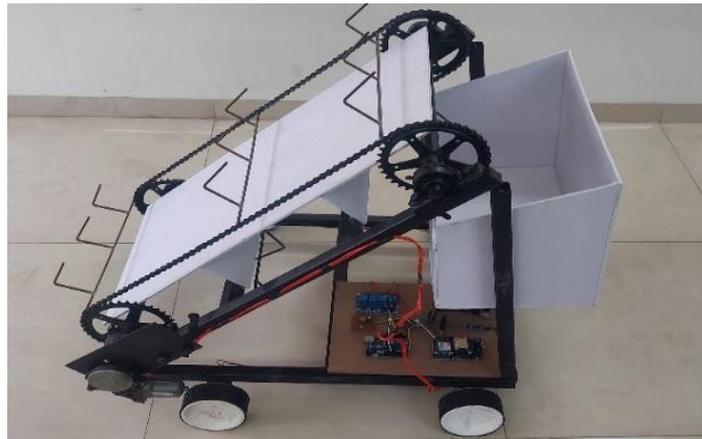


Fig no: 2

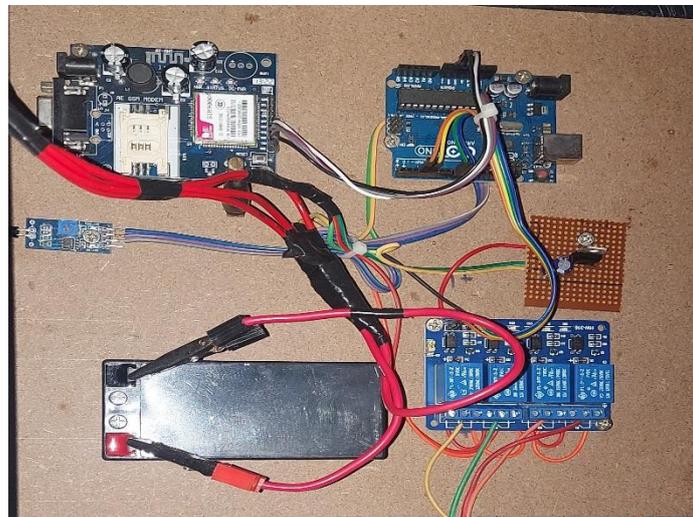


Fig no: 3

**CONCLUSION**

This project's primary objective is to benefit the environment. This project can be used on different coasts and beaches. This allows organizations to do more with their project prototypes and clean better. We use automated robots that do not require human intervention to carry out the beach cleaning process. You can remove plastic from beaches and prevent it from entering the water with automated robots.

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## LIMITATIONS

The robot's capabilities are limited to its programming, and it cannot make decisions beyond its instructions. It may not be able to navigate complex or unpredictable environments without prior programming or adjustments. Maintenance and repair of the robot can be costly and time-consuming. The robot's range of motion and mobility may be restricted, limiting its ability to perform certain tasks. It may also require specific tools or attachments to perform certain functions. The Robot's sensors and detection systems may not always accurately perceive its surroundings, leading to errors or safety concerns. Robot can perform tasks on surface but not in water. It works on batteries so users need to change the batteries accordingly. cost of equipment of robot may be high.