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Waste Segregation Using Arduino

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Abstract: *This document outlines the design and def an anti-sleep alarm system for drivers using an Arduino microcontroller. The system employs an eye blink sensor mounted on the user's spectacles to detect drowsiness. When the sensor detects eyes closed for a duration exceeding 3 seconds, indicating potential drowsiness, an alarm in the form of a buzzer is triggered to alert the driver. If the driver fails to respond within a designated timeframe, signifying a more advanced stage of drowsiness, the system activates an additional safety measure by engaging a mechanism to stop the vehicle. This project aims to enhance road safety by preventing accidents by driver fatigue and drowsiness..*

Keywords: ultra Sonic Sensor, Arduino, Moisture sensor, Servomotor, Waste Segregation

I. INTRODUCTION

Waste management is an increasingly pressing issue in our modern world, with growing populations and industrial activities leading to higher waste generation rates. One of the key strategies in effective waste management is waste segregation, which involves the systematic separation of different types of waste at the source. This process not only helps in reducing the volume of waste sent to landfills but also facilitates recycling and proper disposal of hazardous materials. The importance of waste segregation cannot be overstated, as it plays a vital role in environmental protection, resource conservation, and public health. By segregating waste at the point of generation, we can significantly minimize environmental pollution, conserve natural resources, and mitigate the harmful effects of improper waste disposal. This project focuses on exploring the various aspects of waste segregation, including its benefits, challenges, and implementation strategies. It aims to raise awareness about the importance of waste segregation among individuals, communities, and organizations. Through research, analysis, and practical demonstrations, this project seeks to promote sustainable waste management practices and contribute to a cleaner, healthier environment for

Hardware Technology:

Arduino:

The Arduino Uno is an open-source microcontroller board designed for beginners and hobbyists. It is equipped with digital and analog input/output pins that allow users to connect various sensors and actuators to the board. This enables users to build interactive projects, like robots, temperature monitors, and light shows. The board is programmed using the user-friendly Arduino IDE software and can be powered by a USB cable or battery, making it convenient for portable projects. Released in 2010, the Arduino Uno is the successor of the Arduino Duemilanove and remains the most popular board in the Arduino family due to its ease of use, affordability, and vast community support.

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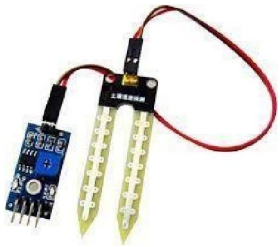
ServoMotor:

A servo motor is a type of rotary actuator that allows for precise control of angular or linear position, velocity, and acceleration. It is essentially a regular DC motor with a built-in feedback mechanism and control circuit. This feedback mechanism allows the servo motor to rotate to a specific angle and hold that position . Servo motors work on the principle of closed-loop control. This means that the motor has a sensor that constantly monitors its position. The control circuit compares the desired position (set by a signal) to the actual position (read by the sensor). If there is a difference, the control circuit sends a signal to the motor to adjust its position until it matches the

Moisture Sensor

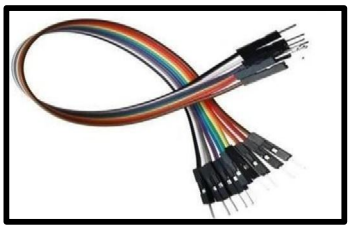
Moisture sensors are electronic devices that measure the water content in a medium, such as soil, air, or even wood. They play a crucial role in various applications and come in different types with varying functionalities

These are the most common type, with two probes that measure electrical resistance. Simple and affordable, they are suitable for basic applications like soil moisture monitoring.



Jumper Wires:

Jump wires, also known as DuPont wires, are electrical wires with connectors on each end that enable the creation of circuits without soldering. They are frequently used on breadboards, which have slots specifically designed to receive these connectors. Different connector types exist, including solid tips for breadboards and crocodile clips for temporary connections to various components. Additionally, jump wires come in various sizes and colors, aiding in distinguishing different signals within a circuit.



Arduino Programming Cable:

An Arduino programming cable connects your computer to your Arduino board, letting you upload code and power your projects. It's a USB cable with a standard Type-A connector for your computer and a Type-B (or C on newer boards) connector for your Arduino. While any matching USB cable technically works, consider cable length, quality, and features when choosing one. You can find them online or at electronics stores.

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Here are some quick tips: handle with care, unplug safely, and try a different cable or USB port if you have connection issues.

With a reliable cable, you're all set to create amazing Arduino projects!

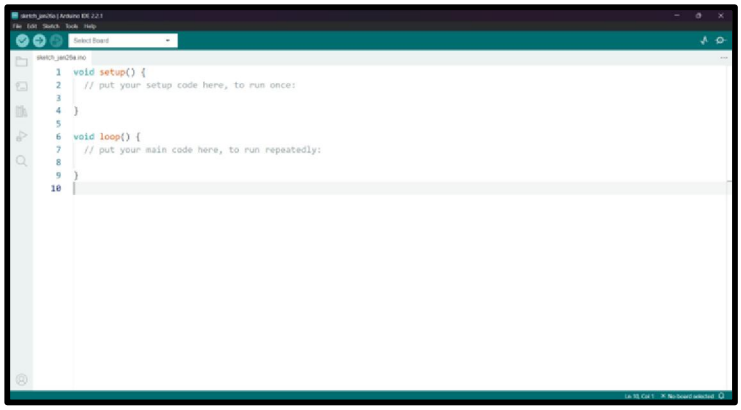
Software Technology:

Arduino IDE:

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino hardware to upload programs and communicate with them.

Programs written using Arduino Software (IDE) are called sketches. These sketches are written in the text editor and are saved with the file extension .ino. The editor has features for cutting/pasting and for searching/replacing text. The message area gives feedback while saving and exporting and also displays errors. The console displays text output by the Arduino Software (IDE), including complete error messages and other information. The bottom righthand corner of the window displays the configured board and serial port. The toolbar buttons allow you to verify and upload programs, create, open, and save sketches, and open the serial monitor.

The Arduino Software (IDE) uses the concept of a sketchbook: a standard place to store your programs (or sketches). The sketches in your sketchbook can be opened from the File > Sketchbook menu or from the Open button on the toolbar. The first time you run the Arduino software, it will automatically create a directory for your sketchbook. You can view or change the location of the sketchbook location from with the Preferences dialog



II. RESULT, CONCLUSION AND FUTURE SCOPE

RESULT

While building an WASTE SEGREGATION system with Arduino can be an educational project for learning about electronics and programming, it is **strongly advised against** implementing the automatic segregate into Dry and Wet waste container

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CONCLUSION

Key achievements and takeaways from this project include:

- Efficient Waste Segregation: The project has demonstrated the feasibility of automating waste segregation, reducing the need for manual sorting and increasing efficiency.
- Promotion of Recycling :- By accurately segregating recyclable materials from non-recyclables, the system contributes to promoting recycling practices and reducing environmental impact.
- Minimized Contamination :- Through real-time waste monitoring and segregation at the source, the system helps reduce contamination in recycling streams, enhancing the effectiveness of recycling processes.
- User-Friendly Interaction :- The user-friendly interface implemented in the system ensures ease of use and minimal user intervention, making it suitable for a variety of settings.

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