International Journal of Research Publication and Reviews, Vol (6), Issue (5), May (2025), Page – 12039-12041

WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Dry and Wet Waste Segregation

Selvakumar A[1], Raja gupta[2], S satheeshkumar[3], B S Sekaran[4], Sri hari M[5]

[1]Department of Electronics and Communication Engineering, Excel Engineering College Komarapalayam-637303, Tamil Nadu, India
[2]Department of Electronics and Communication Engineering, Excel Engineering College Komarapalayam-637303, Tamil Nadu, India
[3]Department of Electronics and Communication Engineering, Excel Engineering College Komarapalayam-637303, Tamil Nadu, India
4Department of Electronics and Communication Engineering, Excel Engineering College Komarapalayam-637303, Tamil Nadu, India
5Department of Electronics and Communication Engineering, Excel Engineering College Komarapalayam-637303, Tamil Nadu, India

Abstract

With the growing global population, managing waste effectively is becoming more important than ever. Properly separated of dry and wet waste helps recycling, reduces pollution and promotes durability. This paper represents an automatic system that accurately wrinks the orts while reducing human efforts. The system uses ultrasonic sensors to find barriers, allowing easy waste placement. A servo motor then leads to the proper section of the waste based on its type. The soil moisture sensor recognizes wet waste, ensures proper disposal. The whole process is controlled by an ardino microcontroller, which coordinates the system's movements. By automating West Seagragation, this system improves accuracy and efficiency when reducing manual labor. This is better supporting smart techniques like this And promotes sustainable practices.

Keywords-automatic waste ruting, sensor-based isolation, environmental friendly disposal

I. Introduction

Sorting the waste properly plays an important role in maintaining a cleaner environment. Dried waste includes materials like paper, plastic and metal, which can be recycled, while wet waste contains food scraps such as biodegradable items that can be made compost. Separating this type of waste prevents pollution and supports responsible disposal. Poor waste management can lead to untoward state and health risks. Accumulated waste attracts insects and bacteria, which increases the chances of diseases. Proper separation helps communities to manage waste efficiently, making neighborhood cleaners and safe. Increasing awareness and educating people about the benefits of waste pruning encourages the culture of responsibility. Governments and organizations can support it by implementing policies, improving infrastructure and promoting recycling initiatives.

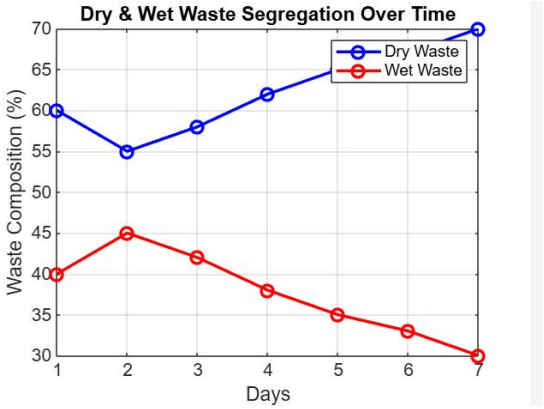

Fig 1 Graph for action

II. Literaturesurveuy

Despite efforts to promote waste separation, many challenges still exist. People often oppose changing their habits, the infrastructure is sometimes insufficient, and policies cannot be strictly applied. Even in cities with awareness campaigns, participation is low until clear rules and encouragement. A successful example is South Korea's "Pe-A-U-Throst" system, which encourages waste sorting by charging based on waste volume. However, similar approaches may require adjustments to work well in small cities or low -income areas. Another issue is ensuring accurate waste separation, especially

plastic, which often mix with other materials, reducing recycling effectiveness. The management of Odors is another challenge, especially in waste treatment plants and landfills. Preventive measures such as proper storage and cleaning, with advanced odor control technologies such as biofilters and chemical scrubers, can improve air quality and make waste features more acceptable for nearby communities. New technologies including AI-operated slaying, IOT monitoring and blockchain-based waste tracking can make waste management more efficient. Cooperation between communities, governments and businesses is important to increase such solutions and ensure permanent waste practices.

III. Methodology

The functioning for automatic waste isolation involves integrating various sensors, microcontroller and actuators to ensure efficient waste sorting with minimal human intervention. The system mainly depends on an Arduino microcontroller to process the sensor input and control the waste separation system. Waste separation includes ultrasonic sensors in the first step, which detect obstacles and help guide waste in specified compartments. This ensures smooth placement and prevents errors in pruning. Once when the garbage system enters, a soil moisture sensor determines whether it is dry or wet waste. If the moisture content is above a set range, the waste is classified as wet, while low moisture levels indicate dry waste. A servo motor then directs waste in the respective storage units based on the classification. It eliminates manual sorting, improves automation efficiency and accuracy. Additionally, the inclusion of wireless communication modules such as Bluetooth or Wi-Fi allows distance monitoring and data tracking, which provides real-time updates on waste collections and isolation conditions. To increase stability, the system can integrate a solar power setup, reducing dependence on traditional energy sources. A data logging system can be applied to store sensor reading over time, which can help customize operations and improve waste separation efficiency. Advanced features such as AI-based automation can be included to further refine waste identification, the sorting mechanism can be adjusted dynamically based on historical data. A combination of sensor-operated waste classification, automatic sorting mechanisms and smart tracking tools ensures well-organized waste management. By reducing manual efforts and promoting responsible disposal, it supports SU

IV.Block diagram

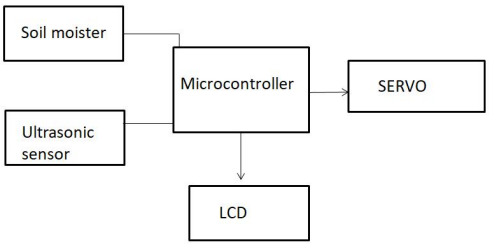

Fig2 represents block diagram

Block diagram figs 2, in addition to already discussed components, block diagrams for this project may include several enrichments to improve functionality and efficiency. Integrating a wireless communication module, such as Bluetooth or Wi-Fi, will enable remote monitoring and control, making it easier to access real-time data from a smartphone or computer. Additionally, incorporating a solar power system can make the setup more durable by reducing dependence on traditional power sources. Another useful joint is a data logging system, where sensor reading is stored in a database or memory module for analysis over time. This can help customize water use and detect patterns in environmental conditions. A buzzer or alert system can also be included to inform users of significant sensor reading, such as low moisture levels or obstacles found in the path. To expand the project to include several sensors, such as temperature and humidity can further increase the sensor, accuracy and adaptability, which can suit the system for various applications in agriculture and environmental monitoring. AI-based automation can also be applied to adjust irrigation or environmental conditions dynamically based on historicaldata.

V.Result

Fig 3 Result

The automatic waste separation system successfully displays efficient pruning of dried and wet waste using a sensor-driven mechanism. The integration of an ultrasonic sensor ensures accurate waste identification, while the soil moisture sensor plays an important role in differences between wet and dried waste materials. Sarvo motor efficiently directs waste in appropriate compartments, reducing the requirement of manual intervention. Arduino microcontroller effectively processes the sensor input and controls actuators, ensuring uninterrupted operation of the system. Results suggest that automation increases the accuracy and speed of waste isolation compared to traditional manual methods. Remote monitoring capabilities, if integrated, can further customize waste management processes by providing real -time data tracking and analysis. The system of system to reduce human effort and improve accuracy makes it a practical solution for urban waste management, possibly contributing to environmental stability and better recycling practices.

VI. conclusion

The project highlights the importance of smart technology in waste management, showing how automation can simplify isolation processes by promoting environmentally friendly disposal practices. By integrating the sensor and microcontroller-based control mechanisms, the waste sorting becomes more efficient, by reducing contamination and improving recycling capacity. The improvement in feature may include AI-propelled classification algorithms, IOT-based monitoring for real-time tracking, and permanent energy sources such as solar power to increase system efficiency. Additionally, extensive implementation in residential and commercial places may support community-managed waste management initiatives. Overrol, the project offers an innovative and scalable approach to pave the way for more advanced and permanent waste disposal solutions in urban and rural environment.

VII .Reference

1. AkshayRao et al., "A study of ultrasonic sensors under garbage surveillance," IJSDR, Volume. 3, no. 5, May 2018. [Online].
2. S. Das, S. Guo, Y. Lu, Y. Zhang, and J. Yan, "Smart Waste Management: A paradigm shift enabled by Artificial Intelligence," Science, 2024. [Online].
3. "Ultrasonic sensor in waste management," Everka, 2024. [Online].
4. S. Sunderingam and R. Ramanathan, "AI Technologies in West Sorting Operations," Science, 2023.[Online].
5. M. Majoroska et al., "Advanced image recognition algorithms for waste isolation," Science, 2022.[Online].
6. "Garbage Monitoring System and Waste Segratter," International Research Journal of Modernization in Engineering Technology and Science, Volume. 3, no. 7, July 2021. [Online].
7. S. Chaubi et al., "IOT-based smart waste system (SGS) for food waste deficiency," IJSDR, Volume. 3, no. 5, May 2018. [Online].
8. J. Dong et al., "Visual data analysis for automatic waste isolation," Science, 2022.[Online].
9. "Automatic West Sorter," Keth Royal Institute of Technology, Sweden, 2022. [Online]
10. "Location trekking and air quality monitoring with IOT-based waste isolation," MDPI, 2024. [Online].