**COURSE TITLE: ROBOTICS USING NIRYO NED 2**

**TEAM:**

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**TITLE:**

**NIRYO KEJRIWAL**

**EXTENDED ABSTRACT:**

This extended abstract outlines the implementation of an automated waste segregation system using the NIRYO NED 2 robotic platform based on color coding. The objective of this system is to efficiently segregate paper and plastic waste for effective recycling and waste management.

Introduction:

The rapid increase in waste generation and its detrimental impact on the environment necessitate innovative waste management solutions. Waste segregation, an integral part of sustainable waste management, ensures that recyclable materials are properly sorted for reprocessing. By leveraging the capabilities of the NIRYO NED 2 robotic system and color recognition technology, we aim to automate the waste segregation process, improving accuracy and reducing human labor.

NIRYO NED 2 Robotic Platform:

The NIRYO NED 2 is a state-of-the-art robotic platform, equipped with advanced sensors and actuators, enabling it to perform various industrial tasks with exceptional precision. The robot's perception capabilities, powered by cameras and RGB sensors, allow it to effectively identify and categorize objects based on color.

Implementation:

The implementation of the waste segregation process involves the following steps:

a. Initialization:

The ROS (Robot Operating System) node is initialized, enabling seamless communication between the NIRYO NED 2 robot and other components of the system.

b. Workspace Setup:

The robot's workspace, designated as "conveyorkejriwal," is defined to facilitate efficient movement and manipulation of waste items.

c. Calibration:

The robot's calibration process is performed using the "calibrate\_auto()" function, ensuring precise and accurate operations.

d. Observation and Pickup:

The robot is positioned at the observation pose above the waste items. The NIRYO NED 2 robot employs its vision capabilities to identify and pick up waste items using the "vision\_pick" function. The "height\_offset" parameter helps fine-tune the pickup position.

e. Segregation:

The color of the picked waste item is determined using the RGB sensor. If the color is identified as "RED" or "BLUE," it is categorized as plastic waste and placed at a specific location using "place\_pose1." Otherwise, if the color is not "RED" or "BLUE," it is classified as green paper waste and placed accordingly using "place\_pose2."

f. Post-Segregation:

Once the waste item is appropriately placed, the robot returns to the observation pose, ready for the next segregation task.

Conclusion:

The automated waste segregation system using the NIRYO NED 2 robotic platform, coupled with color coding, demonstrates a promising solution for effective waste management. By harnessing the robot's capabilities and color recognition technology, the system achieves accurate and efficient segregation of paper and plastic waste, contributing to sustainable waste practices and environmental preservation.

**Github Repository:**

<https://github.com/sidd2305/NiryoNed2-Garbage-Segregation>