Robot Recycler Project

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01 Background

Recycling globally and locally
“engage students in understanding and responding to local and global environmental issues”¹

Loyola’s Mission
Recycling in Chicago

- Chicago is one of the worst cities in the US when it comes to recycling²
  - Recycling rate is under 9%²
Recycling in Chicago

Recycling facility operated by Lakeshore Recycling Systems in Forest View, IL
Trash Barges to China

- The US sent its recyclables in trashbarges to China
- 7 millions tons a year⁴
- 2018 - China banned all its imports of trash⁴

Trash Barge to China⁵
Shipping Plastic Waste

Waste Plastic Sorting Facility in Indonesia⁶
SORTING PLASTIC WASTE

- Countries that import US waste sort it by hand for a lack of an efficient method⁷

Plastic waste being sorted by hand in Babakan, West Java, Indonesia ⁷
Purpose and Function

Eliminates the need for manually sorting waste!

1. Identifies what an object is: glass, plastic, aluminum, etc.
2. Using a camera, the robot locates the size and placement of that object
3. Picks up the object from a conveyor belt to sort it in the respective category
Function - Visual Depiction

Diagram showing a robot connected to a Raspberry Pi, with camera and conveyor belt feeding glass and plastic items.
How I did it

- Programmed the robot using a Raspberry Pi
  - Raspberry Pi - Series of small single board computers
- The wires attached the Raspberry Pi to the robot
- Coded using Python (programming language)
How I did it

- Became intimately familiar with the robot and its movements
- Began by hardcoding many of the movements of the robot
  - Chose specific angles and speeds in different combinations
- Movement examples:
  - `putDownRight()`
  - `setAngle()`
Robot Demo

https://youtu.be/Ck5z4vyvi4
Next Steps

- Ability for camera to distinguish materials
- Locate the coordinates of object and pick it up using relative angles instead of hardcoded ones
Sources


THANK YOU!