CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

Talia Arauzo; Jennifer Lee; Emily Zhang

Project Number

35626

Project Title

Improving Recycling Methods through the Usage of Robotic Devices

Abstract

Objectives/Goals

The objective is to design and build a robot that can sort recyclable objects according to their composition, so that the recycling process may be carried out with more accuracy and celerity.

Methods/Materials

Our team first designed multiple versions of our robot layout, all of the preliminary designs and the final prototype sort through plastic, glass, tin, and aluminum bottles/cans using a hall sensor, voltage sensor, a simple weight test, servos, arduinos, magnets, and wires. Many tests were carried out in order for us to develop the most efficient, consistent, and swift robot.

Results

Our working prototype successfully sorted plastic, glass, tin, and aluminum into their respective compartments. The first test distinguished between metal and non-metal. Non-metals would slide down a vertical pipe for a simple weight test to distinguish between glass and plastic. The metals would continue sliding down the horizontal pipe for a magnetic test, utilizing a hall sensor, to distinguish between tin and aluminum objects.

Conclusions/Discussion

We were able to successfully build a robot that could compartmentalize different recyclable materials. With the integration of our contraption into society, the recycling process could be greatly expedited, especially in buildings with a lot of foot traffic.

Summary Statement

Our project designed and built a robot using servos, various sensors, and PVC pipes that could sort different recyclable objects in order to expedite and improve the recycling process.

Help Received

Our advisor, Mark Wong, gave advice and helped on preliminary designs and to attach servos to robot. Ace Hardware provided donations to buy materials and supplies. Talia's father aided us in using powerful machinery.