

Recycling Robot

Kristina Monakhova

Whittier Middle School, Norman, OK, USA

Recycling Robot

Recycling has become very important to our nation as we strive to lower carbon emissions. Now that people have finally begun to recycle more and more, it's time for robots to lend a helping hand. That is where my robotic display comes in.

In this display, my robot searches for, finds, picks up, and deposits three types of recyclable materials to the appropriate container at a recycling center. To achieve this feat, the bot first searches for a recyclable object using blob tracking on its camera. The object is color coded to help the robot distinguish whether its composition is aluminum, paper, or plastic. Once the bot has spotted the object, the bot approaches it and stops when the object is approximately sixteen centimeters away from the bot in order to pick it up, as shown in figure 2. A servo is used to control a claw to grasp the object and another servo lifts the claw in the air in to keep it from blocking the camera, as shown in figure 1. Then, the color configuration of color model 0 is changed in order to find the correct recycling container. Once located, the bot makes its way toward the container while avoiding any obstacles in front of it by using two Infrared Distance Sensors. The bot drops its cargo into the appropriate box, changes color model 0 back to what it was beforehand, and continues on its search for more recyclable objects. The bot continues this until it has picked up all the recyclable material in the area and then makes its way back to the recycling center and waits for further instructions. The robot is not very efficient because it can only pick up one object at a time, but gets the job done well and thoroughly.



Figure 1: The recycling robot grasps a piece of paper and holds it above its body as it makes its way to the paper recycling bin.

Figure 2: The bot lowers its arm and grips the aluminum in order to lift it back up and deliver it to the plastic recycling container.

