Mean Green Recycling Machine: Robotic-Assisted Recycling Using Neural Networks

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In the USA, 85% of our landfill content is compostable, recyclable, or otherwise reusable; on a global scale, 91% of plastics aren’t recycled, instead ending up in landfills and harming the environment. Most of these reusables are wasted not due to an inability to recycle, but misconceptions about recyclability and a lack of recycling infrastructure, problems that could easily be solved through automation. Building off of the neural network I constructed last year, a physical prototype utilizing a rack-and-pinion for linear movement was built to sort between cans and bottles, along with the creation of a new image dataset of these two categories. The accuracy of the prototype was based upon feeding it an object and observing its classification. The machine had a sorting accuracy of 96.3% over 54 trials, sorting into categories accordingly. In conclusion, my engineering project resulted in the creation of an automated recycling bin that sorts with 96.3% accuracy, expandable to multiple categories.

Awards Won: