Demonstration and Accuracy of Machine Learning for Sorting Recyclables

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The project demonstrated how machine learning can help sort recyclable materials in a domestic setting. The aim of the study was to create a machine learning model and associated mechatronics that could sort between aluminum cans and plastic bottles with a minimum accuracy of 90 percent. /bThe author created a Teachable Machine model that distinguished between images of plastic bottles, aluminum cans, and neither using similar training images. A p5.js code sketch connected the machine learning model to a computer's webcam, allowing the model to classify images from the webcam feed and indicate this classification via a Serial output. An Arduino UNO board read these outputs and moved a connected servo to different positions based on the model's classifications. The author measured the accuracy of the model using 30 testing images that the machine learning model did not use during the training process. The accuracy of the overall machine learning model was 70 percent, with accuracy varying across object categories, most likely because of the background content of training images and the limited number of testing images. The project's findings have broad implications for the future of at-home recyclable sorting and could assist in the development of consumer products such as self-sorting recycling bins.

Awards Won: