Bin There Dump That

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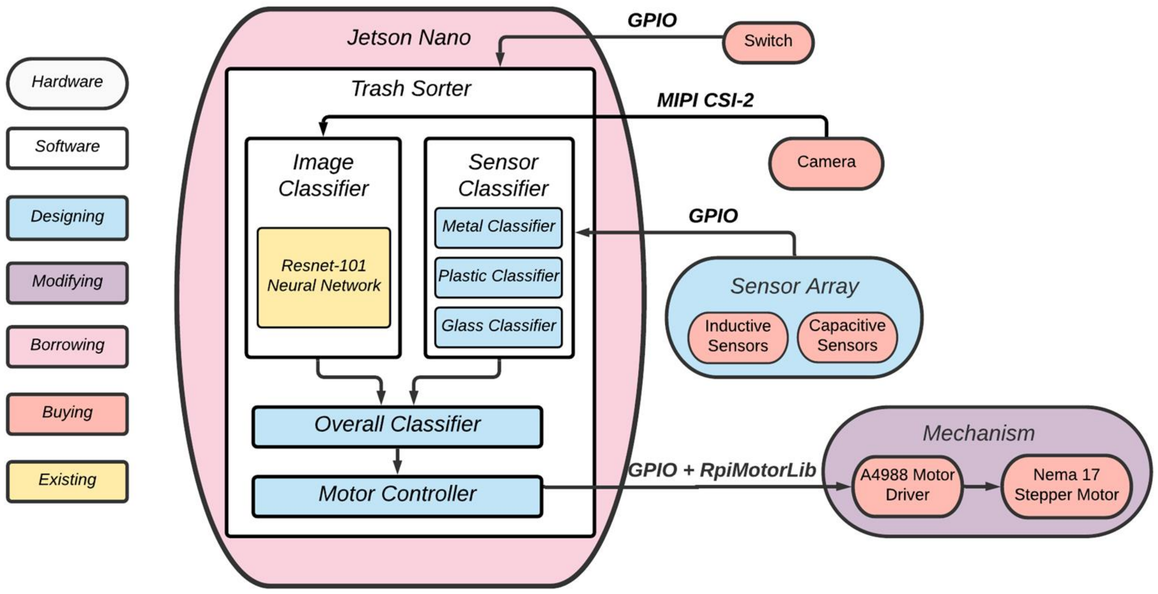
Electrical & Computer ENGINEERING

Product Pitch

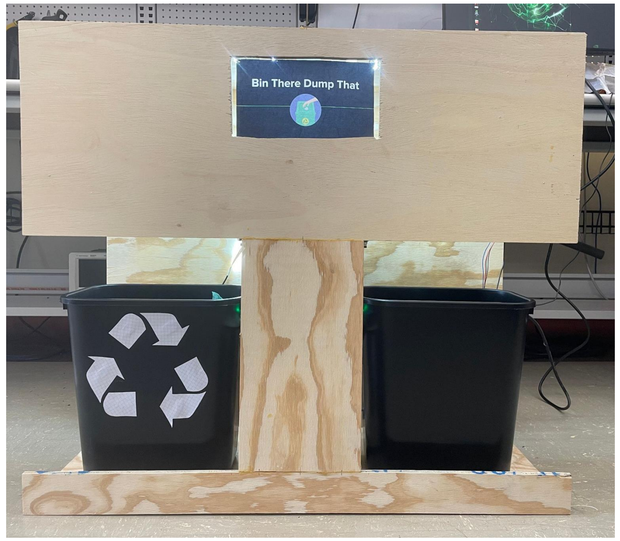
Our automatic trash sorter will be able to put items into one of two categories: recyclables and non-recyclables. Users won't have to think about how to sort their trash; our sorter will do it for them! Users will be able to insert items one-by-one into our sorting platform and can watch it automatically move items into the correct bin. We aim to improve recycling accuracy rates and decrease recycling contamination rates on CMU's campus. We used a camera and 28 sensors to distinguish between different types of recyclables and trash. Our goals included 90% accuracy in sorting objects, each under a second, and we ultimately achieved 90.6% accuracy in sorting objects, each under 3 seconds.

System Architecture

System Block Diagram



System Description



System Evaluation

Classifier Accuracies by Material

Material	Sensor	Image	Overall
Plastic	79.6	42.7	89.8
Metal	96	82	98
Glass	76	90	96
Paper/Cardboard	52.2	84.8	91.6
Recyclables	67.1	80.6	93.4
Trash	92	96	89
Overall	67.1	80.6	90.6

50 trials/material for sensor, image classifiers
100 trials/material for overall classifier

Goals

	Metric	Results
Mechanism Accuracy	99%	100%
Classifier Accuracy	90%	90.6%
Latency	< 1 s	< 2.78 s Classifiers: 0.117 s Mechanism: 2.66 s