DeepWaste

Applying Deep Learning to Waste Classification

Yash Narayan
yasnara@nuevaschool.org

THE NUEVA SCHOOL

2 billion tons of solid waste

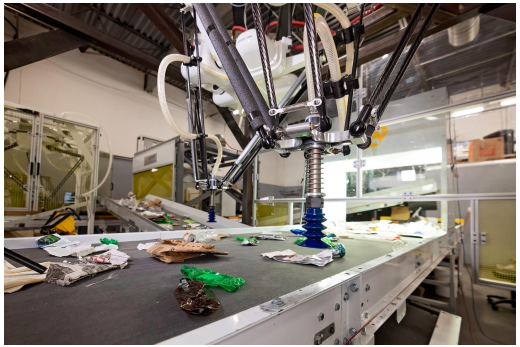
25% of recyclables contaminated

Compost

Previous Work

Signs and boards near waste bins are confusing

"Smart bins" require expensive hardware



Current research suffers low accuracy and is slow

Guiding Question

Can we provide an approach for waste classification that is **fast, low-cost, and accurate** for anyone, anywhere?

AI Challenges

Material properties hard to detect from an image

Materials can come in any shape

Data Gathering Process

Over 1200 images manually collected and annotated

Firebase

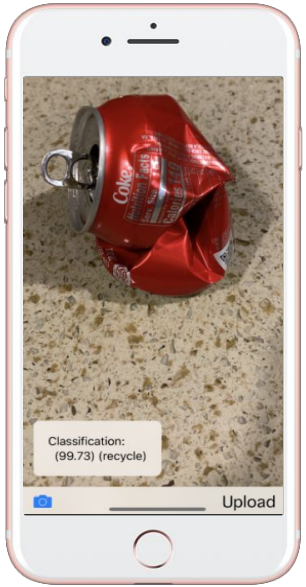
Data set grows with more users!

88.1% average precision

Accuracy	Inception_V3	Inception_ResnetV2	Resnet_50	MobileNet	PNAS_net
Trash	0.771	0.773	0.761	0.751	0.722
Recycle	0.891	0.783	0.924	0.949	0.864
Compost	0.806	0.806	0.882	0.873	0.841
Overall	**0.84**	**0.82**	**0.881**	**0.842**	**0.852**

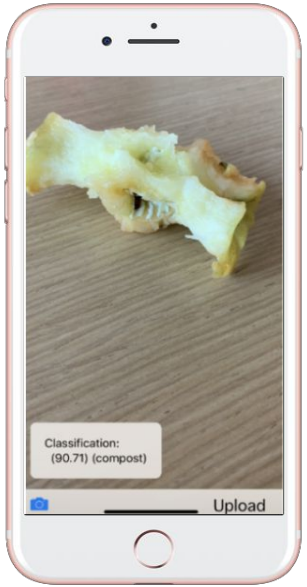
DeepWaste App

Recycle

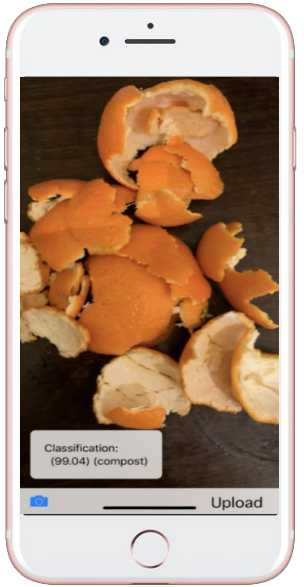


Recycle

Trash



Compost



Compost

1% less erroneous waste disposal = removing over 6.5 million cars