Garbage Classifier

Cleaning the world...

Stakeholder Presentation

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Every day…

3,500,000 tons

Waste produced

Every day…

17,000 tons

Garbage release in the ocean, mostly plastic

Every day…

170,000,000 $

e-waste value in landfills

Recycling

A possible solution

- Right now only about 9% of the worlds waste is being recycled
- There is the opportunity to make a profit by recycling valuable materials
- Many governments pay much money to process waste and to do it in an eco-friendly way
- Money can also be made by selling the recycled materials to manufacturers to reuse
- Very good PR and marketing move to increase company’s involvement in recycling

Recycling
Current problems

- Trash usually comes all mixed

- Recycling works best if each material is separated from the others

- The separation process can be slow and require a lot of manpower

Software solution

The idea

- Fast identification of different materials
- With fine-tuning it can reach really high accuracy
- Easy implementation with already existing hardware
- Almost no maintenance required
- Easily scalable

Software solution

What is it ?

- Image classification software
- Approx 80% accuracy
- Recognition of 6 different materials

1. *Plastic*
2. *Cardboard*
3. *Paper*
4. *Metal*
5. *Glass*
6. *Trash*

The Dataset

What it sees

- Contains 2537 images
- RGB, 3 channels
- Original shape: 512 x 384
- Jpeg format
- 43.4 MB in size
- 6 different classes
- Hand picked and labeled

https://www.kaggle.com/asdasdasasdas/garbage-classification

Glass

Cardboard

Plastic

Metal

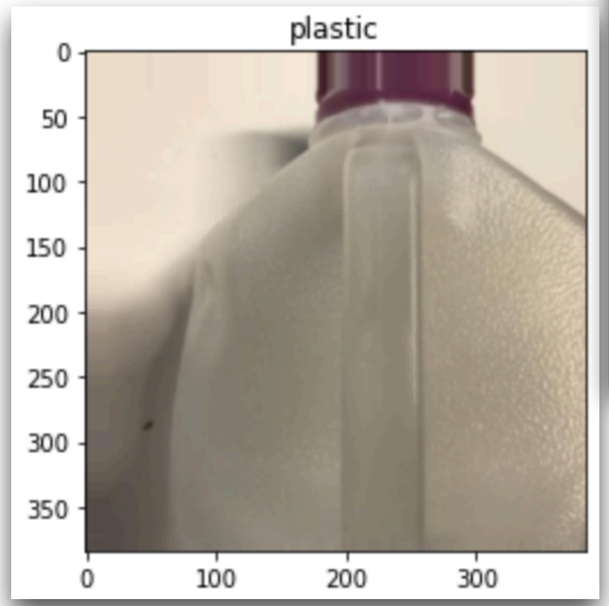
Paper

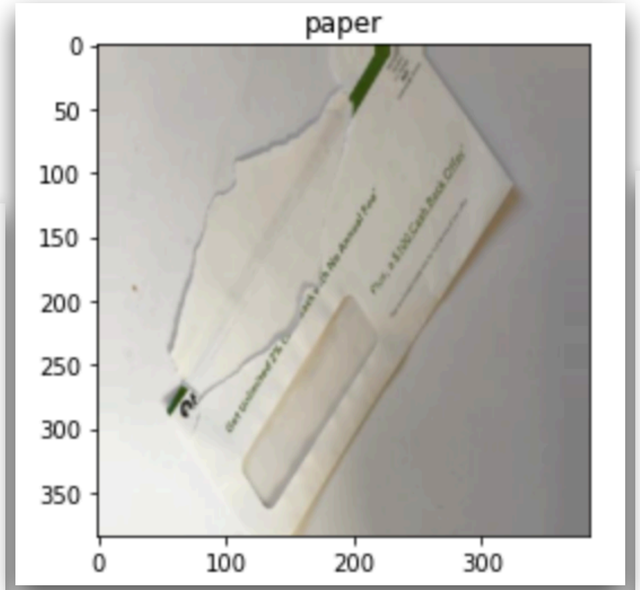
Trash

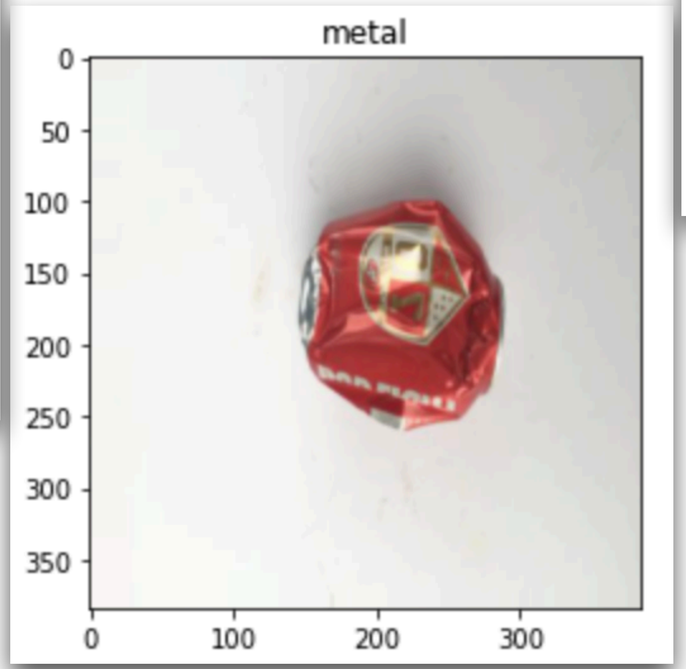
The model

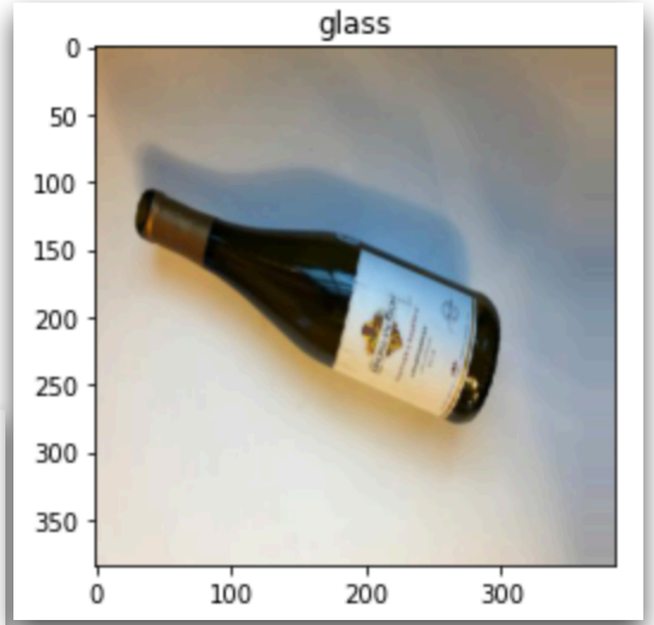
See it in action

- This is how the model classifies these few samples









Deployment

Make it work

- The final use case of the model is to embed it in a waste separation machine
- An hardware solution will physically divide the waste elements as told by the model
- It will integrate the physical separation methods already in use
- It will speed up the process of separation and increase accuracy

Deployment

Challenges

- The model can only recognise one class per image
- A segmentation model is required to extract images containing just one item
- The images will then be fed to the model for classification
- The dataset can be increased to include many more recyclable materials