Bio-Logistic Regression

—Code In Flux

Meet our diverse and international team

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Overview

We are leavening the capability of AI to generate a model which will convey whether the waste product in an image is recyclable or not. Moreover it will also suggest the proper way to handle it.

We generated a Machine Learning Model and trained it over the existing datasets of images of Waste Products found on Kaggle. We have created the model to categorize accurately if the waste product shown in the image is recyclable or not.

Goals

1. Classifying products as Recyclable or Disposable/Organic

2. Generating a signal/alert telling the result in a visual format

Problem Explanation

According to a statistical analysis conducted in the United States of America , 75 % of the country's waste is recyclable yet only 30 % of the waste is actually recycled. So tons and tons of recyclable waste makes its way to the landfills instead of getting recycled leading to wastage of resources , soil contamination and harm towards the environment.

A single recycled plastic bottle saves enough energy to run a 100 watt bulb for 4 hours. It also creates 20% less air pollution and 50 % less water pollution than would be created when making a new bottle.

The United States throws away **$11.4 billion** worth of recyclable containers and packaging every year. If 1/10 of all discarded American newspapers were recycled annually, approximately 25 million trees would be saved.

Thus, recycling becomes a huge concern when we want to work towards a better environment. We are trying to propose a solution to this problem via Machine Learning.

What it does

We built up an application which allows the user to click a picture of the waste products and via the Deep Learning model it categorizes if a waste product is recyclable or disposable. This way an automated system could be installed in the places where waste management is done.

Technologies Used

I.   Flutter - (Frontend)

We used Flutter to build an application which would do the task of capturing the image and then sending that image for processing to the model.

II.   MongoDB - (Backend)

A NO SQL database to store all the scanned pictures of the users and storing the classification and use it in case of recurring images for faster processing.

III.   AI (PyTorch, TensorFlow and Keras)

A model with brilliant accuracy was required in order to read the image and classify it. We tried different methods in order to achieve that accuracy in a low number of epochs. Finally, we were able to reach the accuracy of 97% using a multilayered Neural Network.

Further Scope

This is just a key foundation step of using Deep learning models for the problems faced by humans.

- We could install such a model in places where waste products need to get categorized. We are talking about scales varying from regular household to large scale industries.
- The model could be connected to a separator via IoT and this way the waste management process will be completely automatized.

Challenges we ran into

The frontend and backend were created on various platforms and were working independently , connecting the different parts and making it work as a single unit was a difficult task to accomplish.

References

For the facts and information :

- [The Recycling Industry is losing money](#)
- [Think Twice about your trash](#)