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Computer Vision-Based Garbage Classification

Description

Currently, garbage is classified into recycling categories manually. However, sometimes people might be confused, so that there might be mistakes about the category during the classification since people tend to make mistakes more than machines. **The aim of the project** is to find an efficient way to automate classifying trash. Therefore, a computer vision approach will be used, which will provide predictions about its material based on the images in our training datasets and their labels. We are going to predict the category of an object which are battery, organic, glass (brown, green and white), plastic, metal, cardboard, paper and trash.

Description of the Data

The *Garbage Classification Dataset* contains 2467 RGB coloured images with 512×384 dimension from 6 different classes: cardboard (393), glass (491), metal (400), paper(584), plastic (472) and trash(127) [1].

Garbage Classification (12 classes) dataset has 15,150 RGB colored images with 512 x 384 dimensions from 12 different categories: paper, cardboard, biological, metal, plastic, green-glass, brown-glass, white-glass, clothes, shoes, batteries, and trash. However, we can use paper (1050), metal (769), plastic (865), glass (1236), and trash (697) datasets and combine these two datasets since the smaller dataset is the subset of this one [2].

Action Plan and Milestones

We are planning to create a working prototype by the **mid-term progress demo**. Firstly, the dataset will be preprocessed to extract the distinctive features of different materials. We will divide the dataset into two parts; the first part will be used to train the model and the second part will be used to evaluate the model's accuracy and prediction. Then we will build a model which is suitable for classifying new test data into their respective materials. We will work on optimizing the performance and increasing the accuracy of the model by the **final demo**.

References

[1] “Garbage classification,” *Kaggle*, 24-Nov-2018. [Online]. Available: https://www.kaggle.com/asdasdasasdas/garbage-classification. [Accessed: 27-Oct-2021].

[2] M. Mohamed, “Garbage classification (12 classes),” *Kaggle*, 24-Jan-2021. [Online]. Available: https://www.kaggle.com/mostafaabla/garbage-classification. [Accessed: 27-Oct-2021].