VANDERBILT UNIVERSITY

Bottle Image Classification Project Proposal

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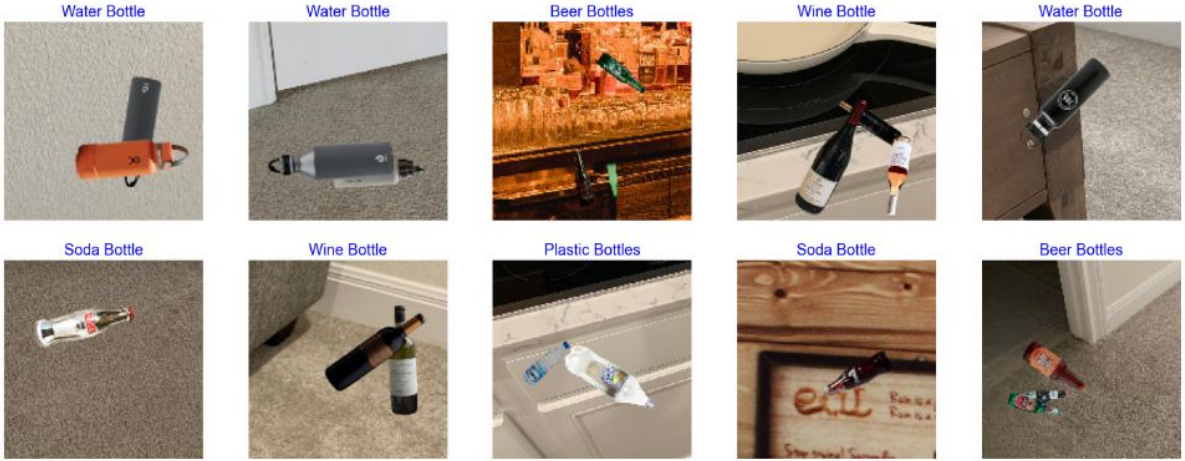
Problem

The problem we are solving through our project is to be able to classify different types of bottles through image classification. We think this could be useful in practical applications, like sorting for recycling. The below shows different types of bottles that we want to be able to label.

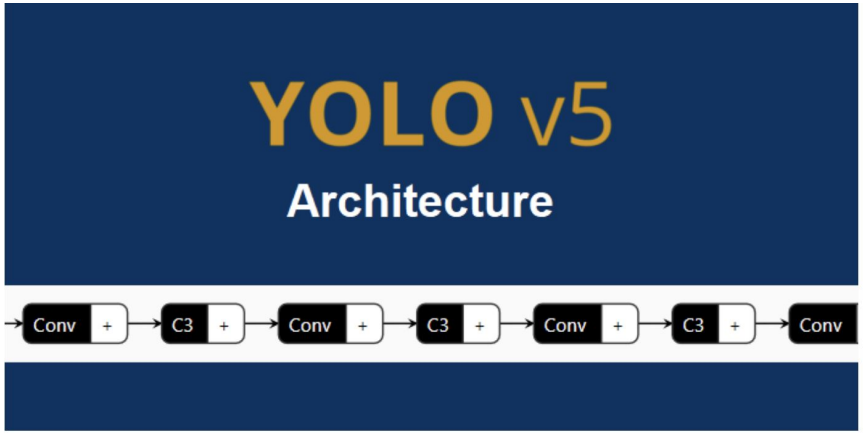


Challenges

- First time implementation of image classification model
- Similarities between different types of bottles might be hard to classify
- Large amount of data requires ACCRE capabilities
- Necessity to create new bottle images in order to test our model beyond the data already provided

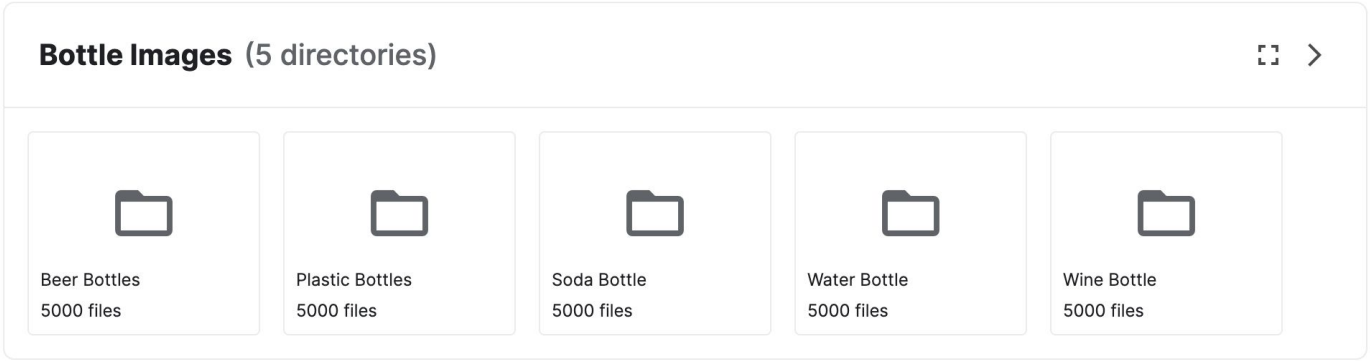
Method

- We plan to use a simple Convolutional Neural Network as a baseline model
- We then plan to test different more advanced model architectures to see if they improve the baseline (YOLOv5, MobileNetV2, ResMLP, ResNet)



Data

- 5 different types of bottles (wine, beer, water, plastic, and soda)
- 80% of images will be used for training set and 20% for the test set
- https://www.kaggle.com/datasets/vencerlanz09/bottle-synthetic-images-dataset



Expected Outcome

- We expect one of the more advanced architectures to perform better than a baseline model
- We expect to be able to classify new images with accuracy
- We hope to have an accuracy, F-1 score of above 90%