VANDERBILT UNIVERSITY

Bottle Image Classification Project Update

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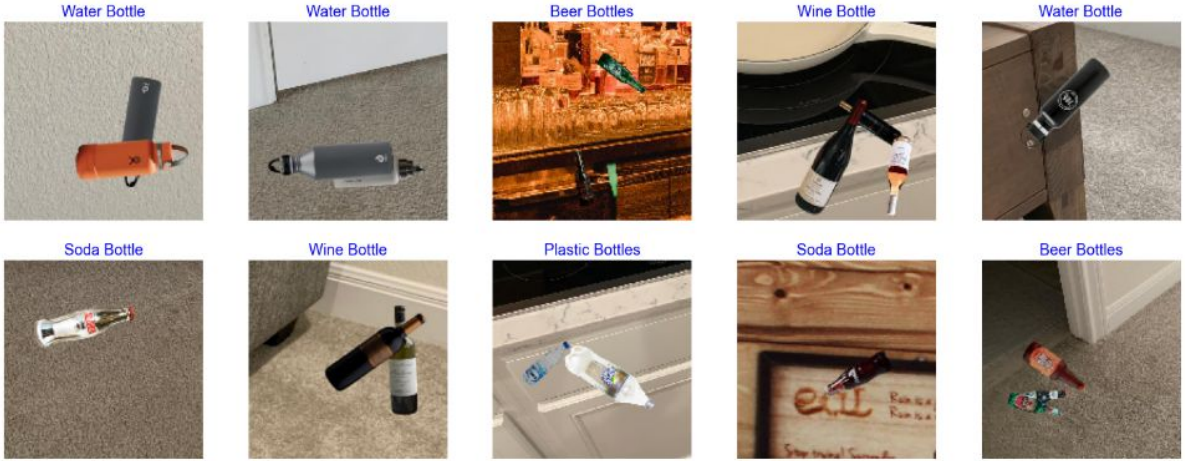
Problem Reminder

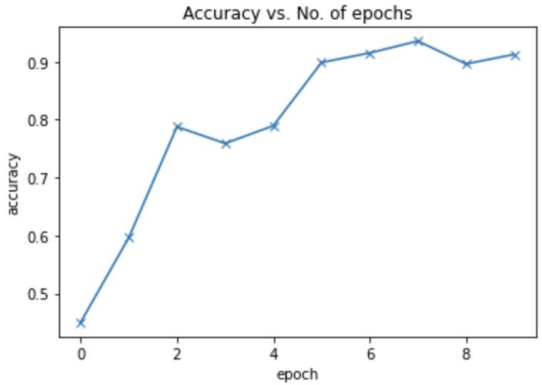
The problem we are solving through our project is to be able to **classify different types of bottles through image classification**. We think this could be useful in practical applications, like sorting for recycling. The below shows different types of bottles that we want to be able to label.



Base Model

- We first implemented a baseline CNN model using PyTorch on Google Colab to gauge how effective a base model is and to compare to future, more advanced models

Model	Accuracy	Model Runtime
Baseline CNN Model	0.9128 (10 epochs)	~ 1 hour



ResNet Model

- We then implemented a more advanced model architecture using ResNet and our accuracy improved above our baseline model

Model	Accuracy	Model Runtime
Baseline CNN Model	0.91 (10 epochs)	~ 1 hour
ResNet	0.96 (9 epochs)	~ 3 hours

Increased accuracy using ResNet model architecture

Challenges

- We have a significant amount of data for our project (25,000 pictures) so we initially had some issues uploading the data to Google Colab in a timely manner
    - We were able to create a Github repository and load in our data through our repo
- For the baseline model and ResNet, even with GPU, we had some challenges with lengthy training times with the amount of data that we have
    - ResNet timed out in Google Colab at 9 epochs (~3 hours)
- We had to try different methods and alter the baseline model in order to have a model that was computationally effective

Next Steps

- We plan to refine our ResNet model to reduce runtime
- We also plan to research other model architectures to see if we can achieve a better or similar result for a lower runtime