



an **NTT DATA** Company



Everis Machine
Learning Prize

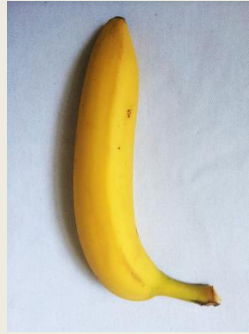
João Figueira
Tiago Almeida

1st Phase

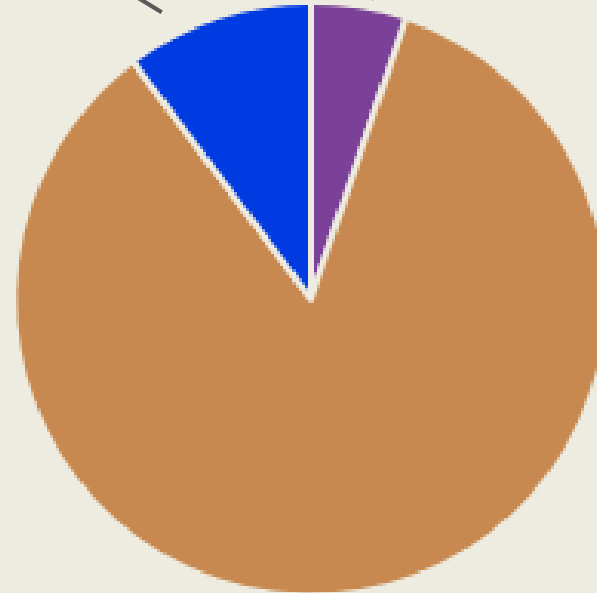
Dataset Creation



Dataset Sources



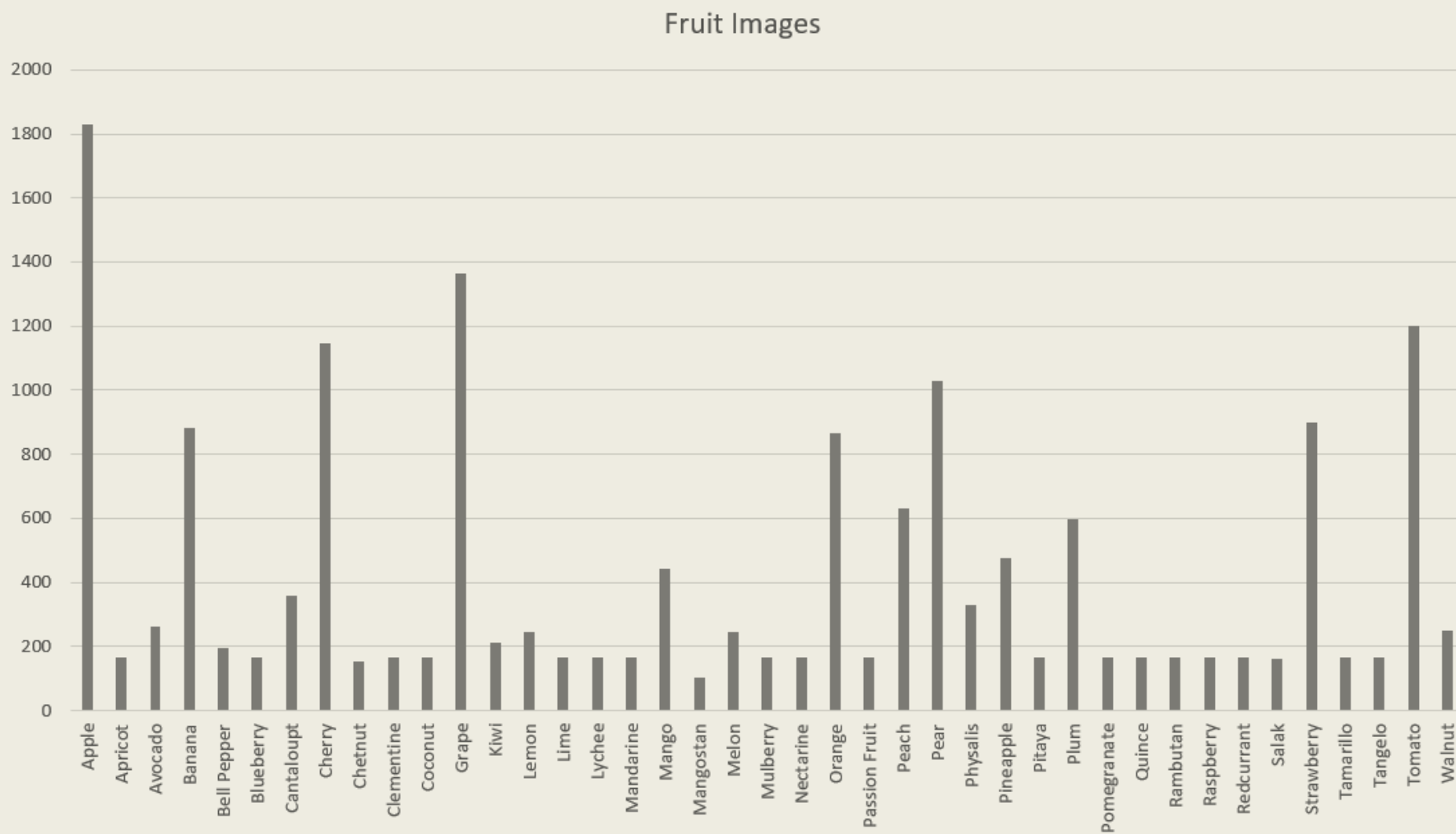
Using Google images scraping library for Python by Hardikvasa



Fruits 360 Dataset by M. Oltean

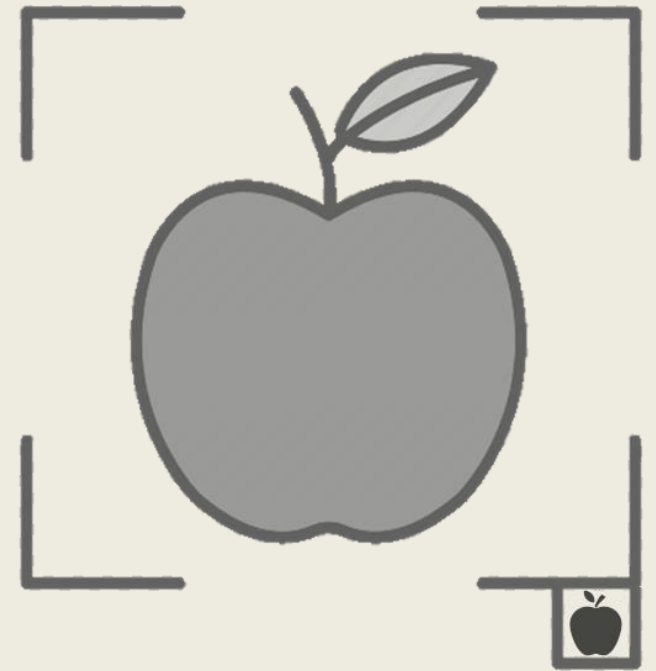
■ Our Photos ■ Dataset ■ Google Images

Dataset Composition

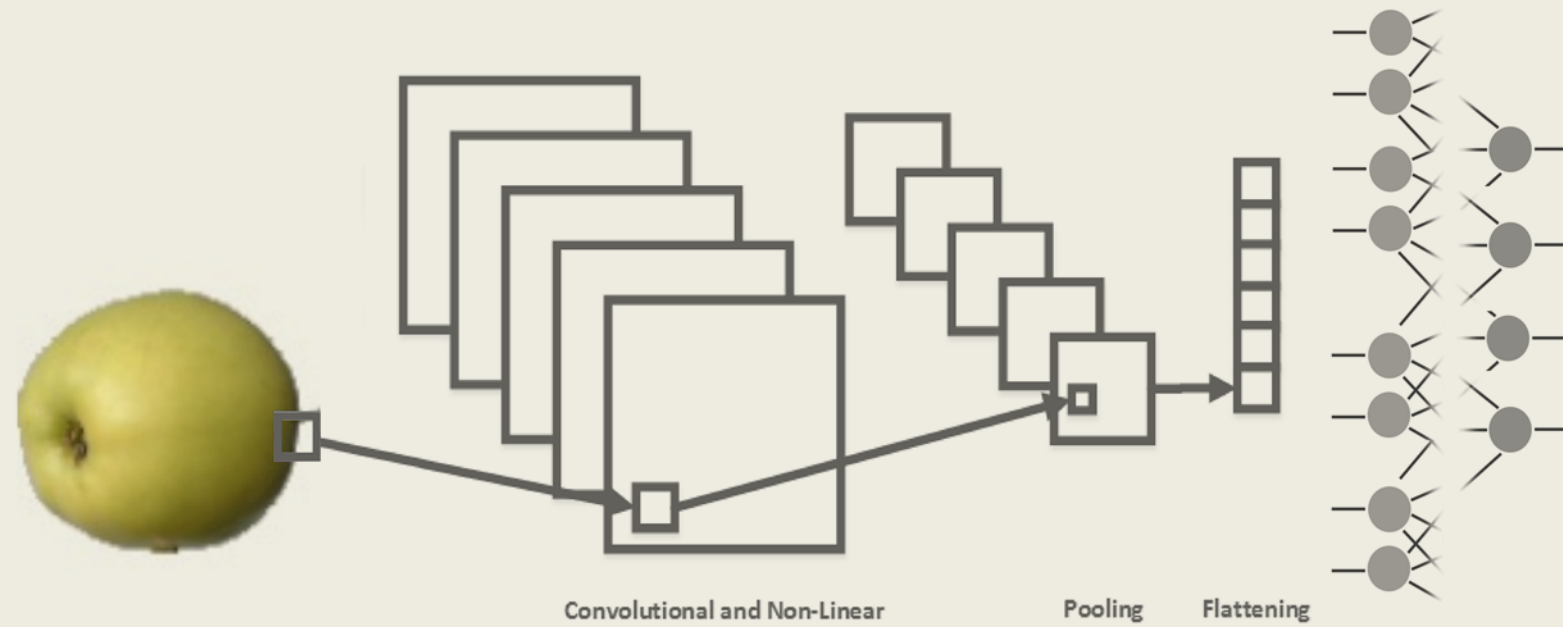


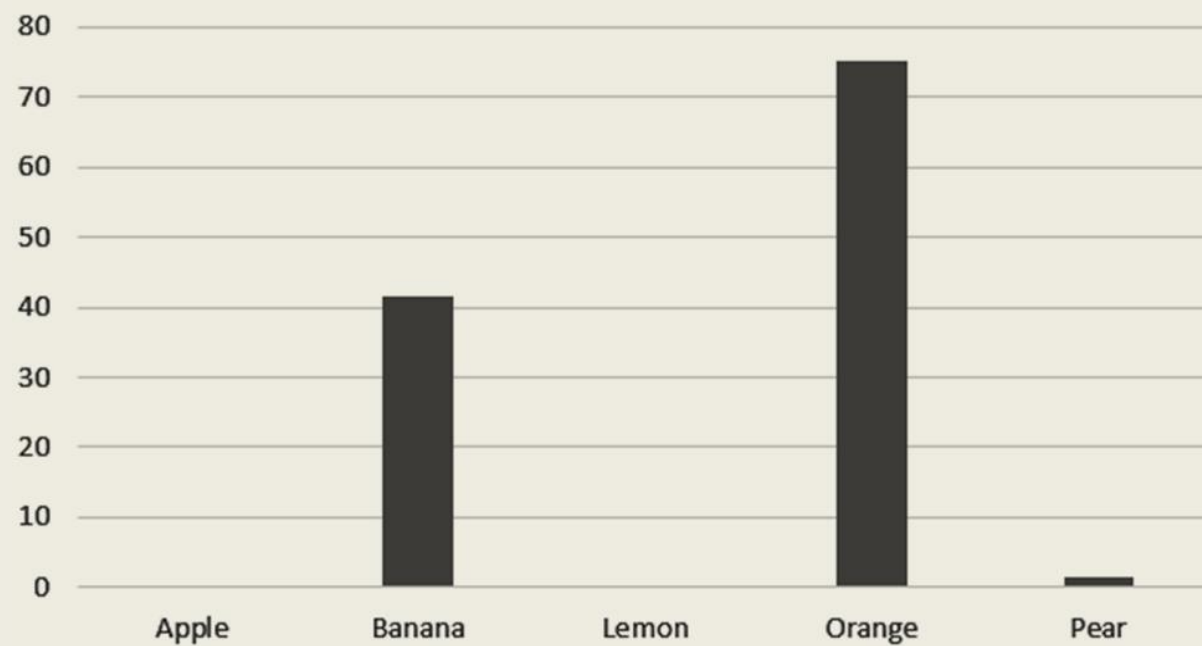
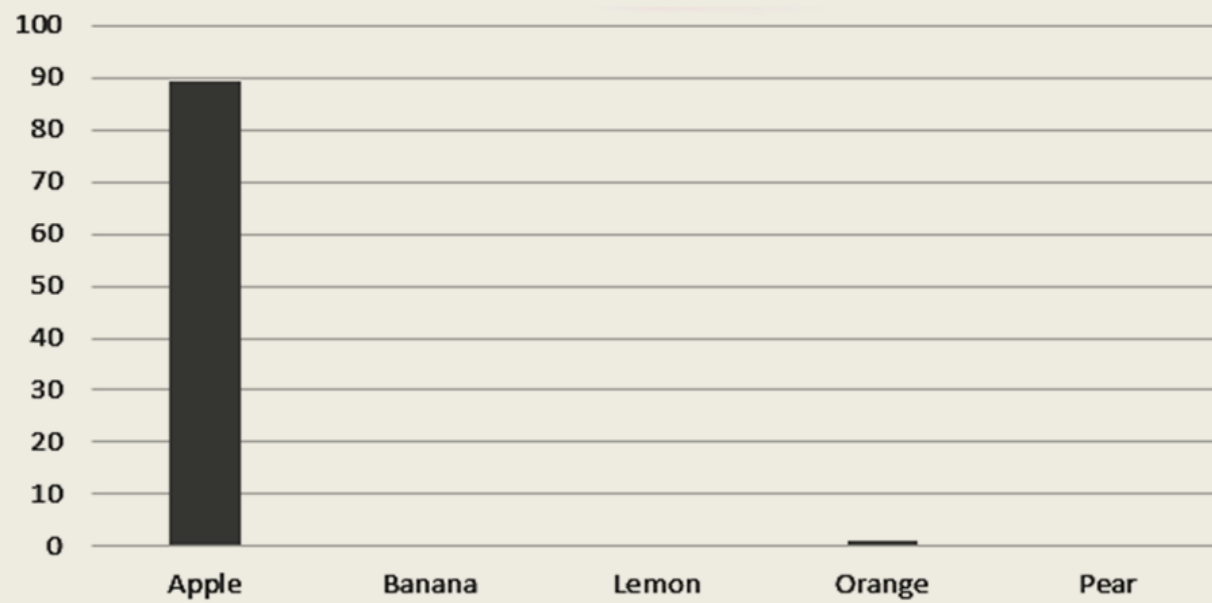
2nd Phase

Single Fruit Classification



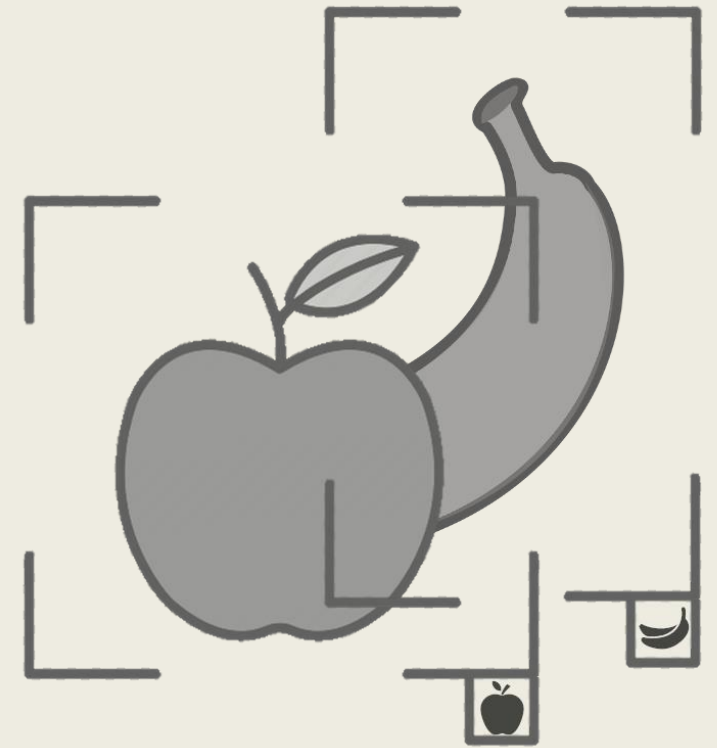
Convolutional Neural Network





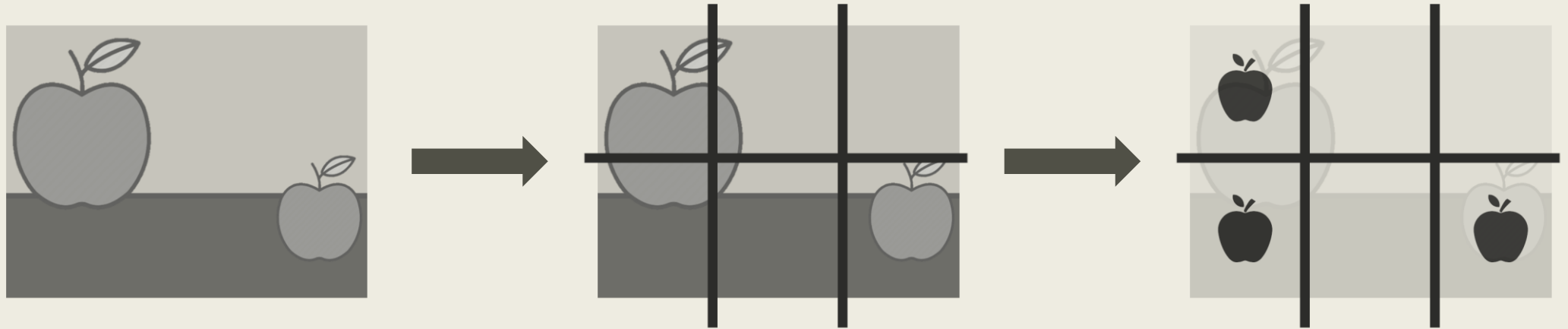
3rd Phase

Multiple Fruit Detection

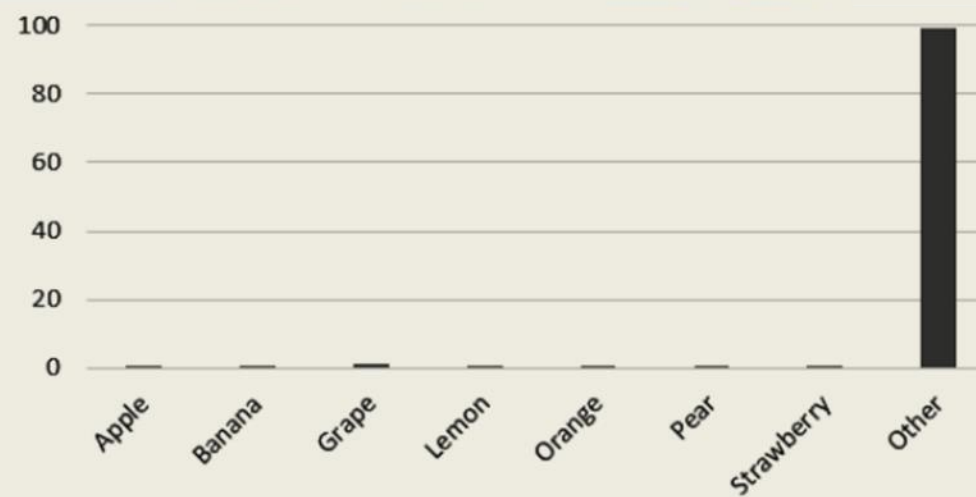


1st Approach

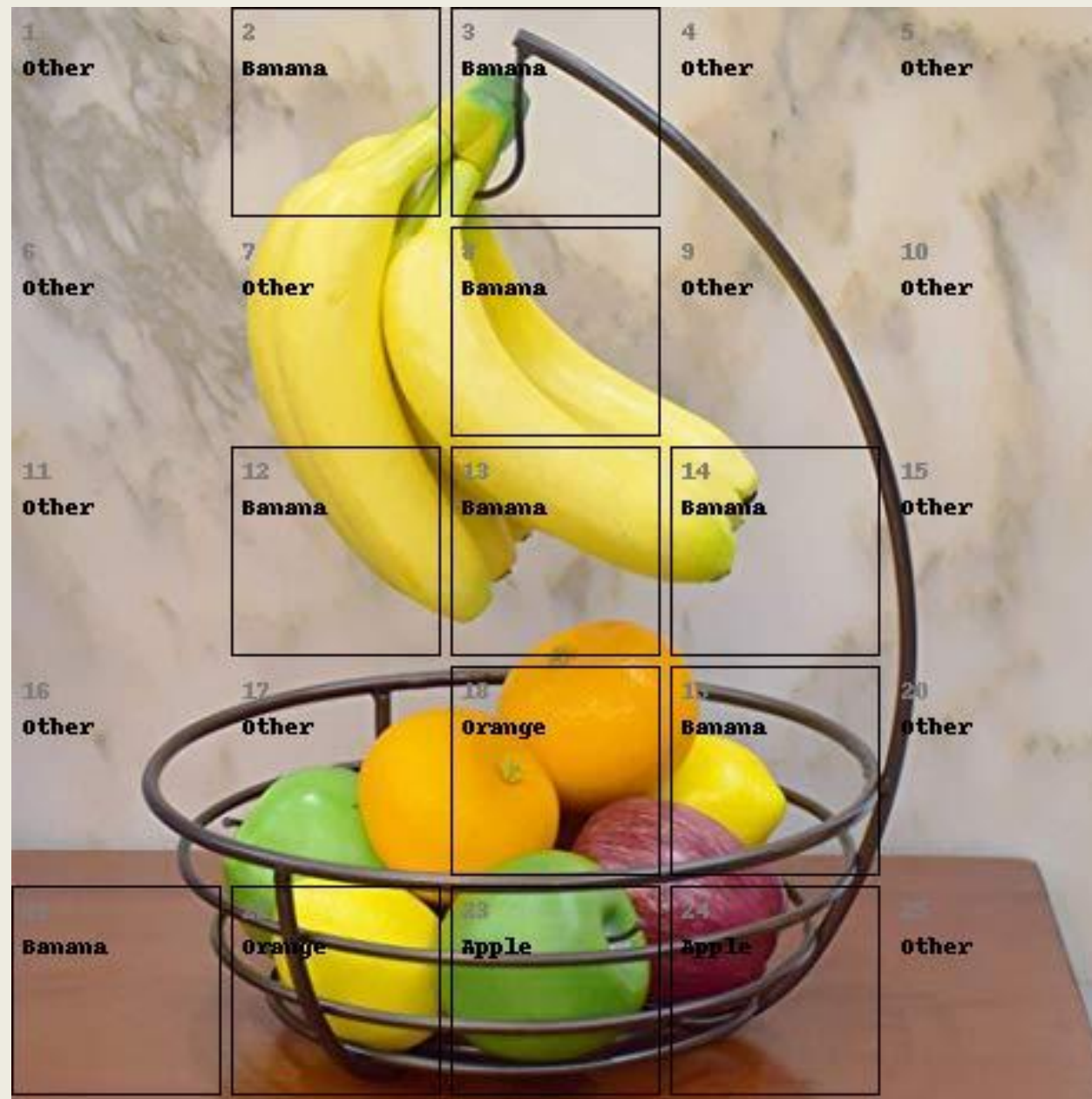
Using 2nd Phase Model



Non-Fruit Classification



Results



1
other



2
other

FRUITS

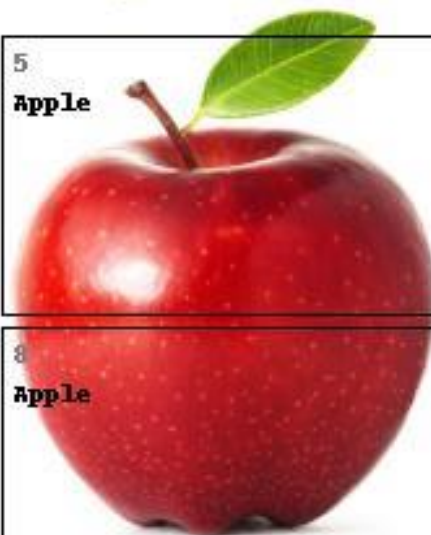
3
strawberry



4
other



5
Apple



6
Orange



7
Pear



8
Apple



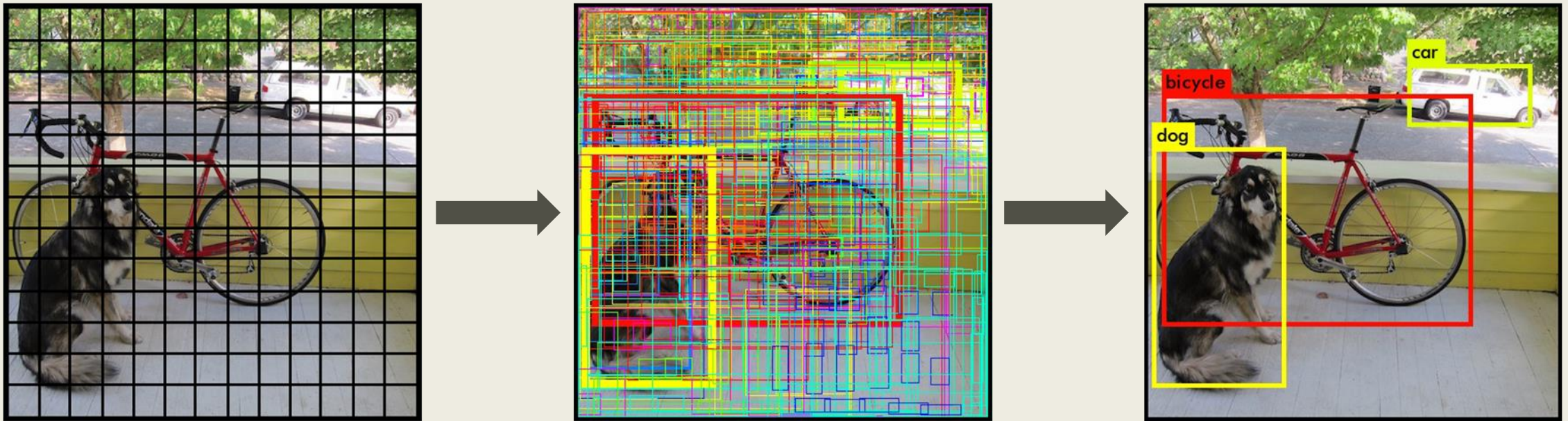
9
Banana



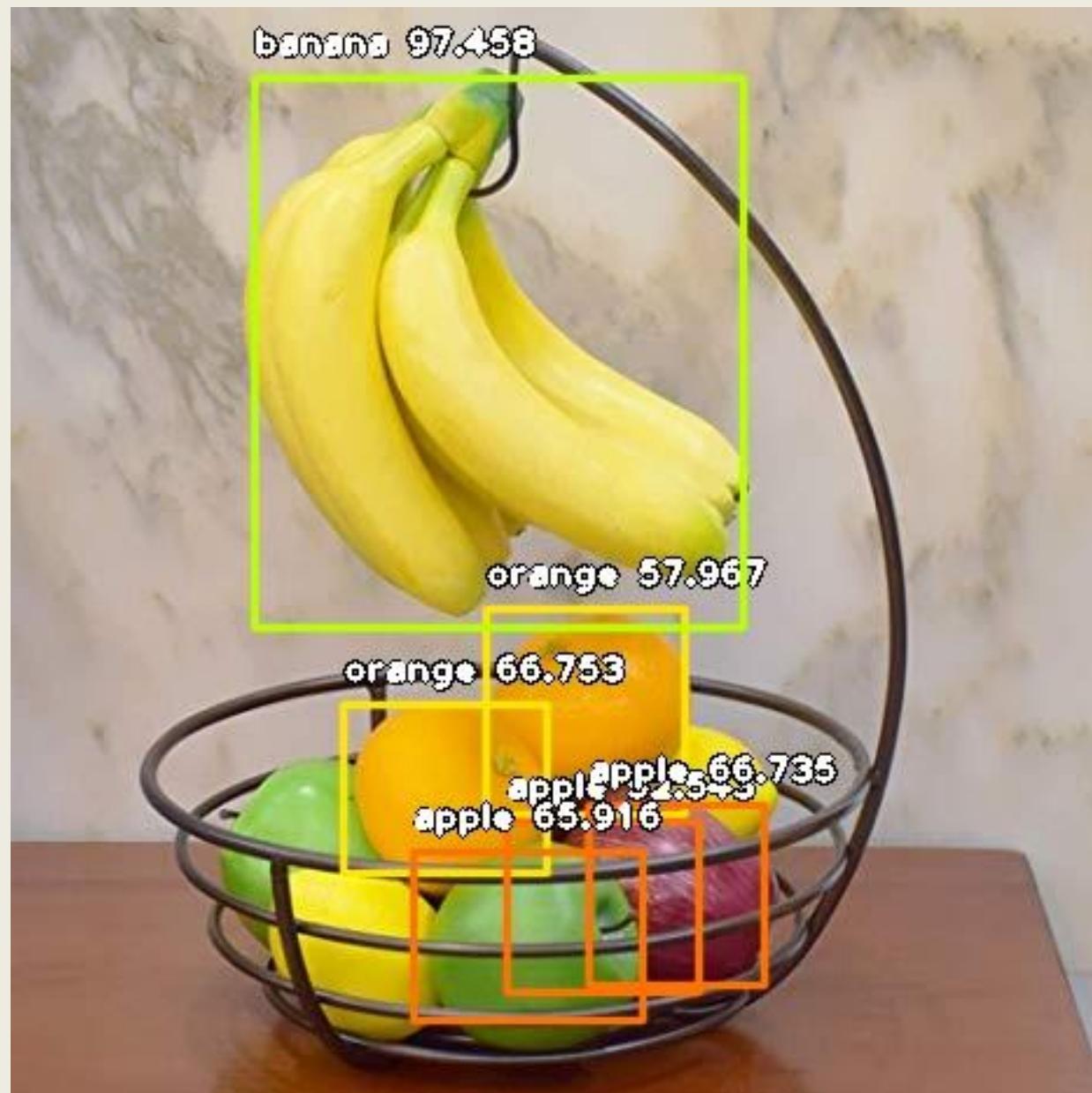


2nd Approach

YOLOv2 with COCO Library



Results



FRUITS



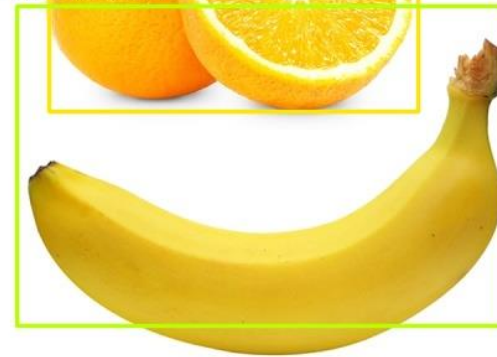
apple 87.630



orange 88.157



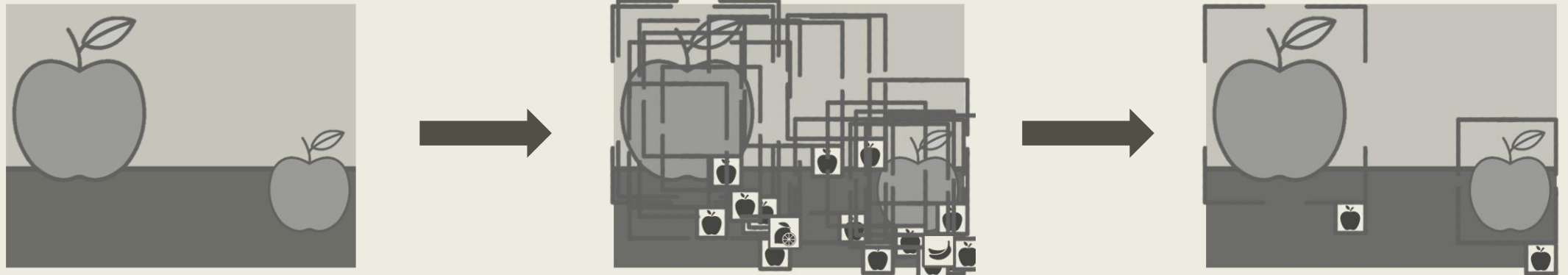
bananas 98.530



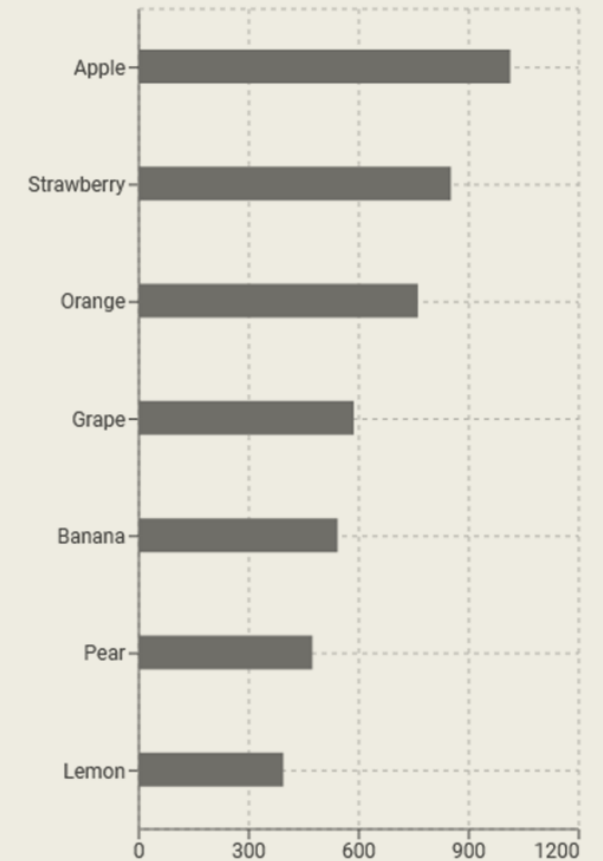
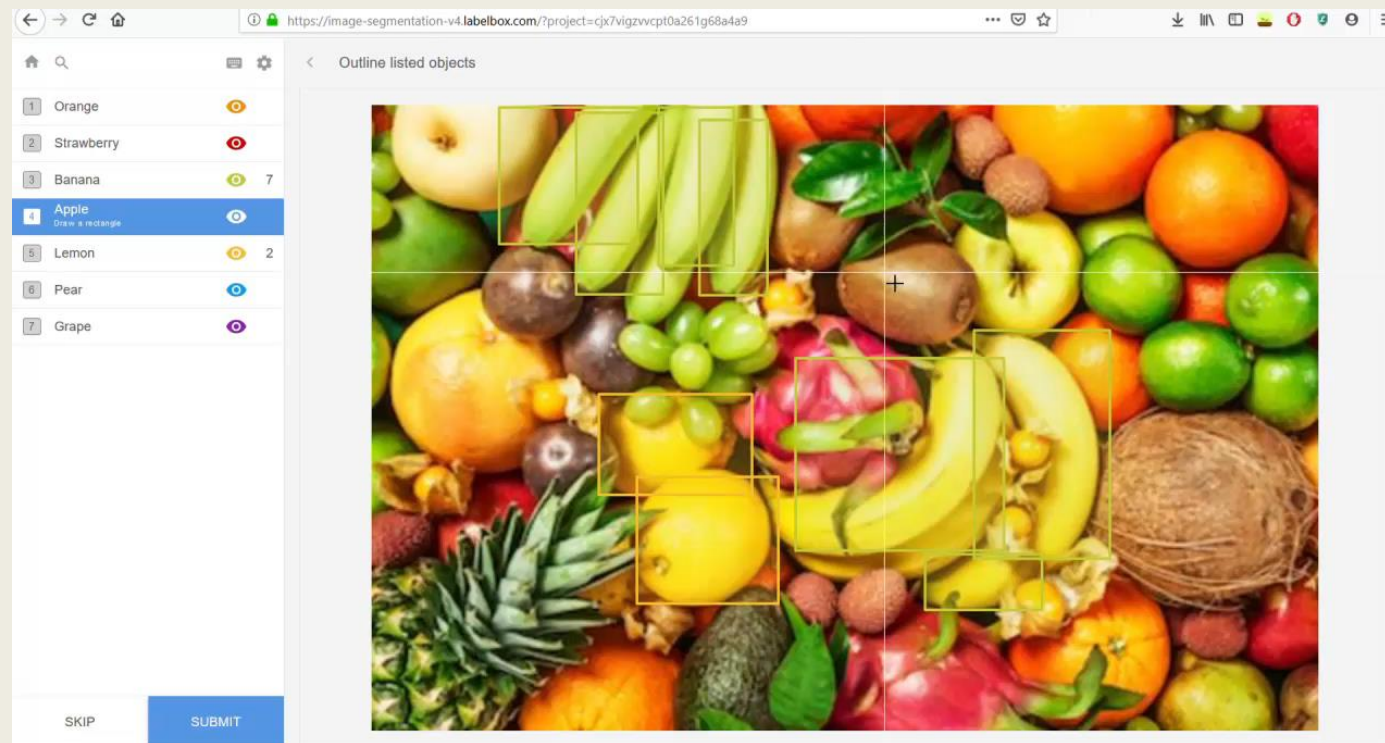


3rd Approach

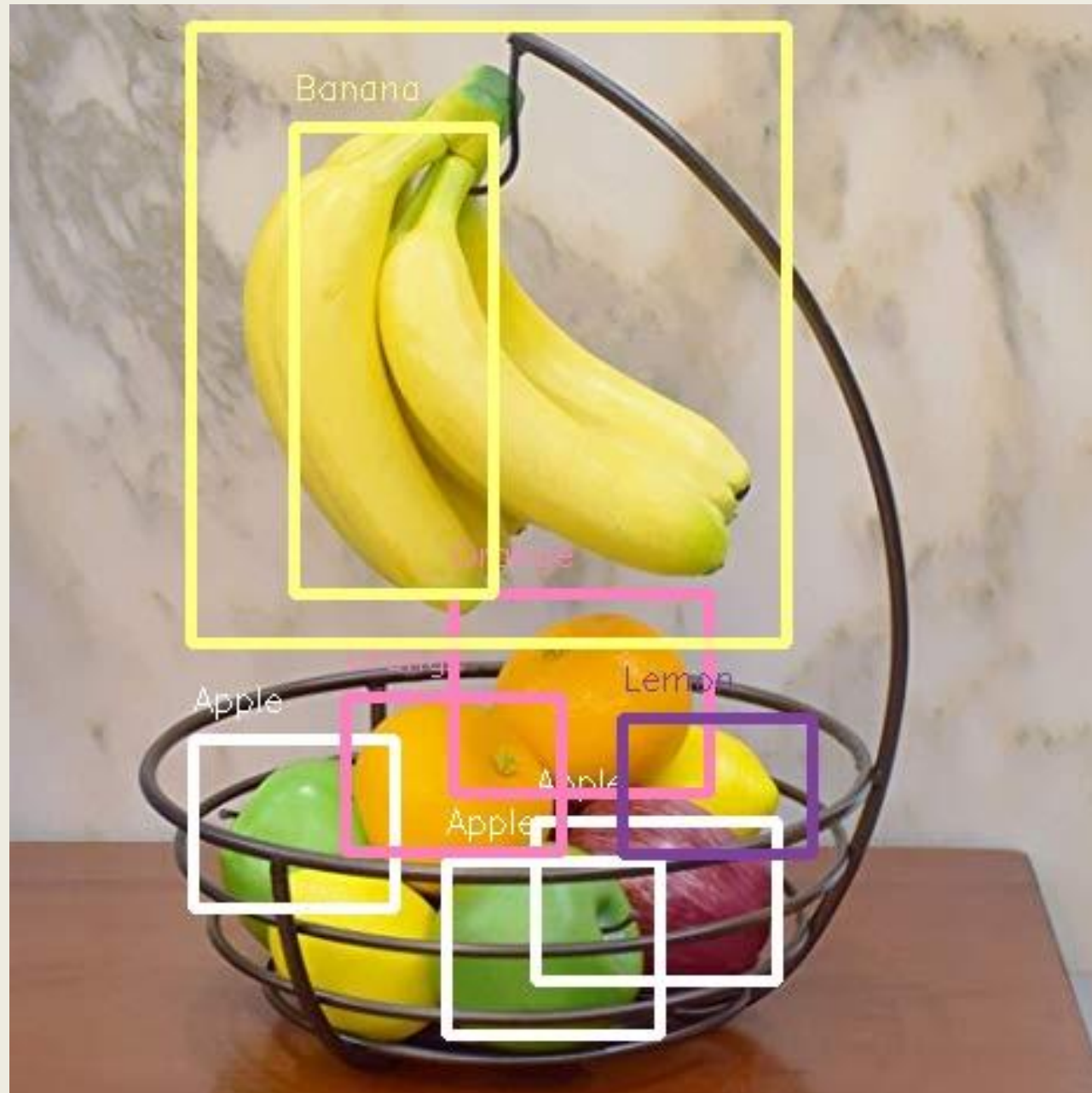
YOLOv2 with Custom Library



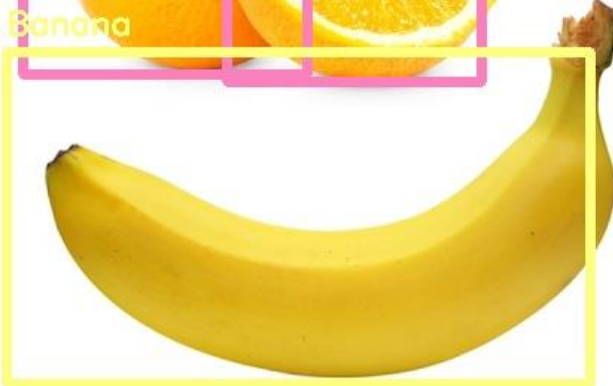
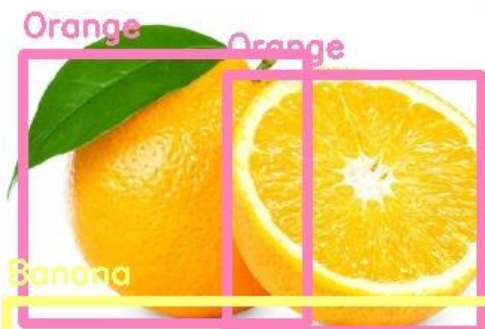
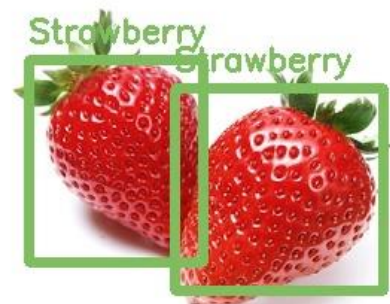
Dataset Augmentation and Adaptation

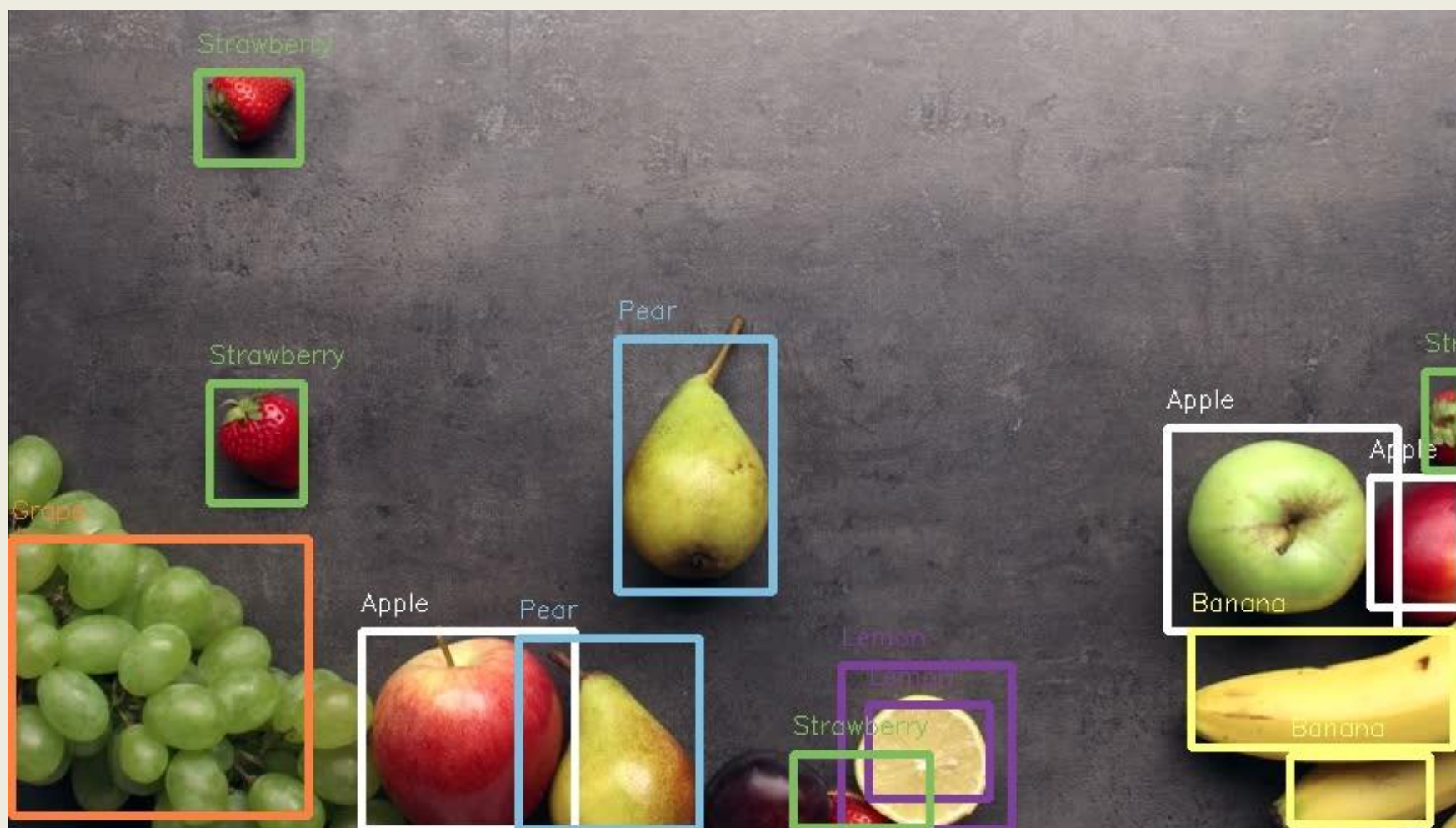


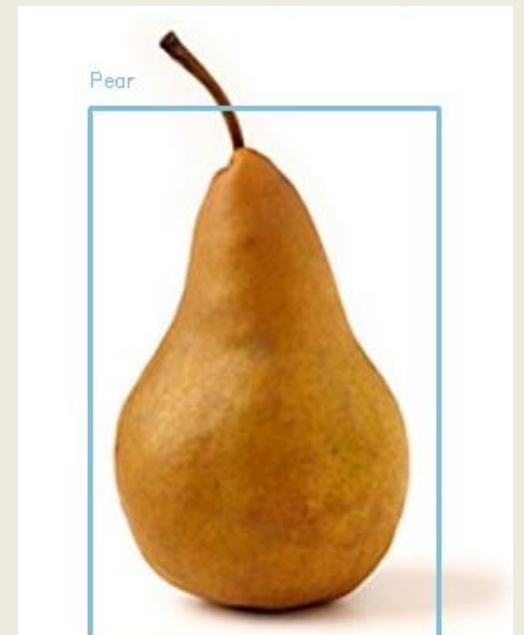
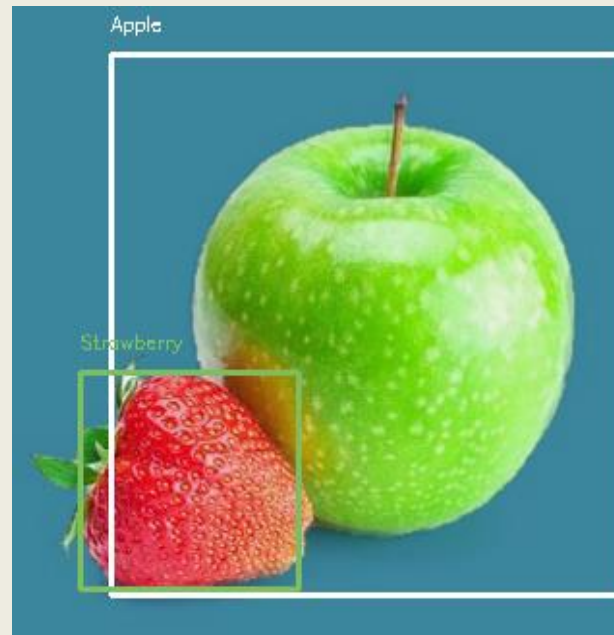
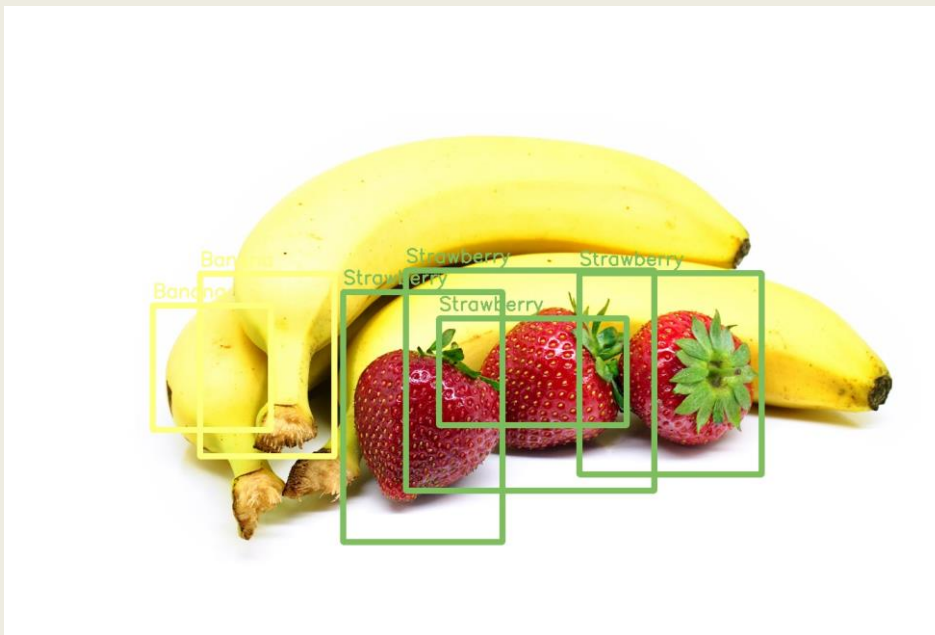
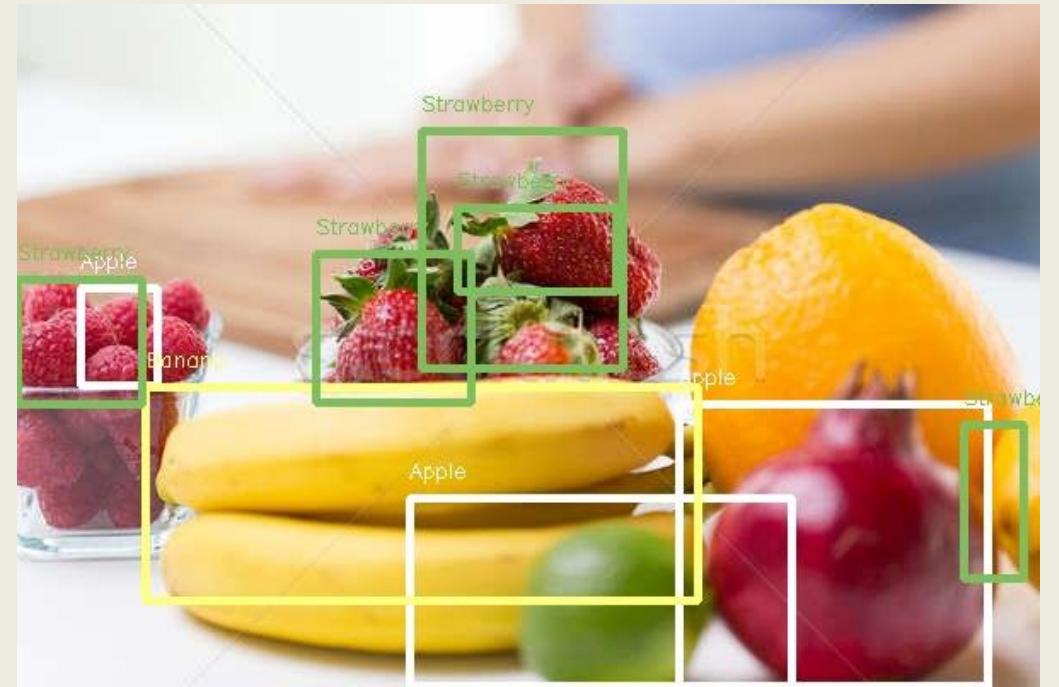
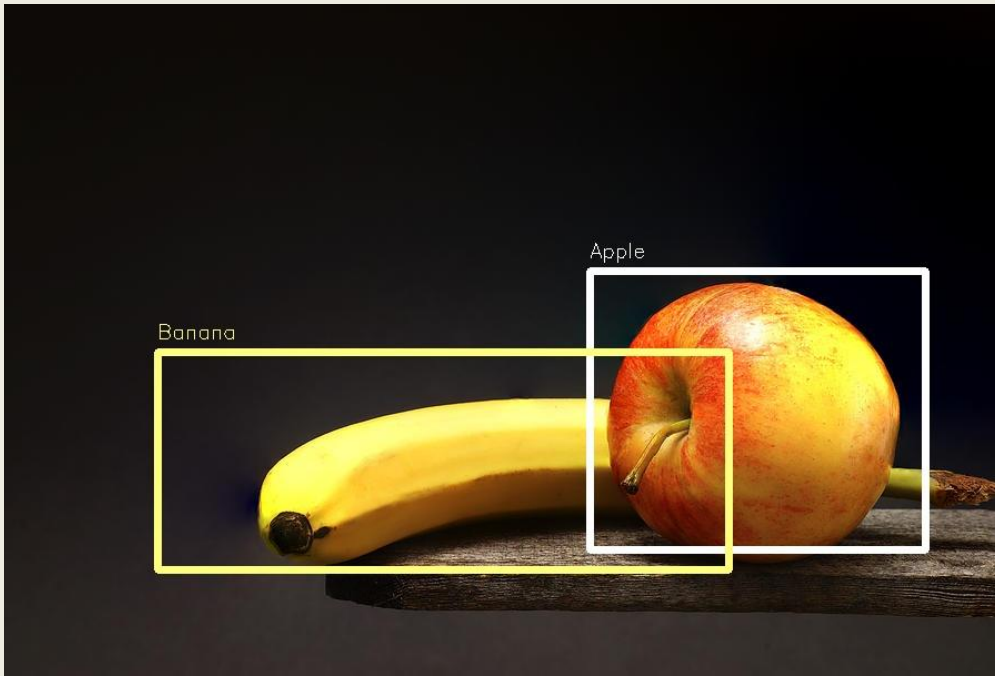
Results



FRUITS



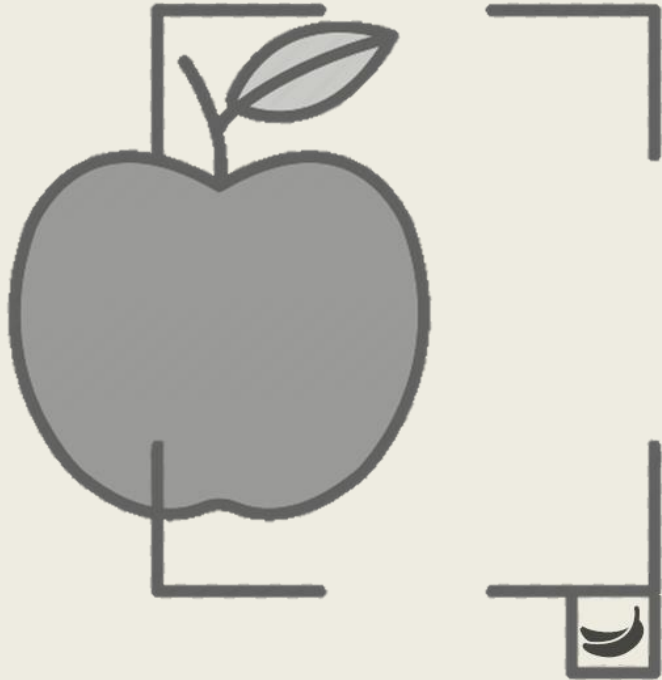




Real-Time Capabilities



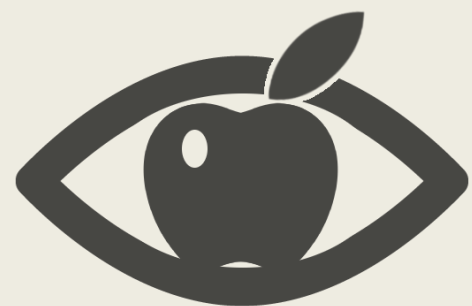
Future Improvements



- More fruit classes
- More labeled objects
- Stronger hardware



an **NTT DATA** Company



THANK
YOU!