

# Learning model training with agricultural crops image classification

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# About the dataset

The challenge involves classifying agricultural crop images into certain categories. The goal is to accurately identify crop types from images, i.e. an image of a cherry will be labeled under 'Cherry' which can be useful for applications such as automated crop monitoring and precision agriculture, or even just for fun.

# Intro

- 829 images, 30 classes (crop type), jpg, jpeg, png file types
- 642 files for training total
- 60 files for validation total
- Number of training images: 12
- Number of validation images: 3
- Testing was any remaining images in classes I chose (classes = ['Cherry', 'banana', 'coconut', 'chilli', 'Cucumber'])
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# Preprocessing

**Resizing:** All images were resized from 1000x1000 pixels to 224x224 pixels to standardize input size for model training.

**Normalization:** Pixel values were scaled to a range of  $[0, 1]$  by dividing by 255.

**Augmentation:** Applied random horizontal flips, rotations, and contrast adjustments to increase data diversity and robustness of the model.

# Visualization

- **Sample Images:** Displayed several example images from each crop category to understand visual variations within and across classes.
- **Observations:** Images for each crop type exhibit significant variation in color, texture, and shape, the next slide is just an example of one class from the kaggle website
- Some classes have fewer examples, ranging from 21 to 39 image files in a class

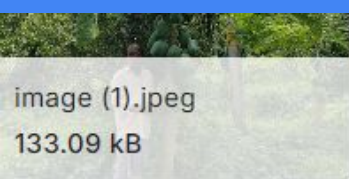


image (1).jpeg  
133.09 kB

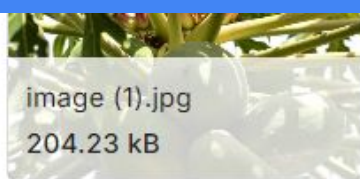


image (1).jpg  
204.23 kB

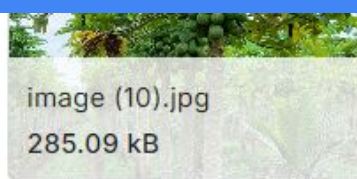


image (10).jpg  
285.09 kB

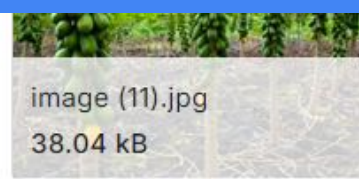


image (11).jpg  
38.04 kB

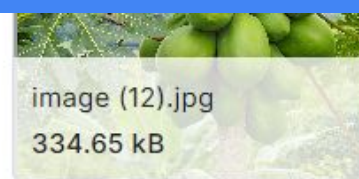


image (12).jpg  
334.65 kB



image (13).jpg  
19.63 kB

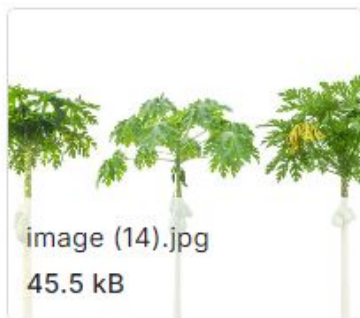


image (14).jpg  
45.5 kB



image (15).jpg  
128.81 kB



image (16).jpg  
23.82 kB

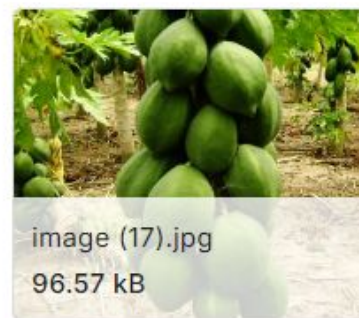


image (17).jpg  
96.57 kB



image (18).jpg  
730.68 kB

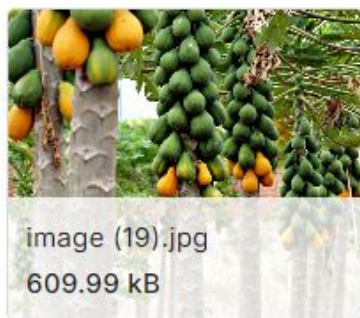


image (19).jpg  
609.99 kB



image (20).jpg  
92.12 kB



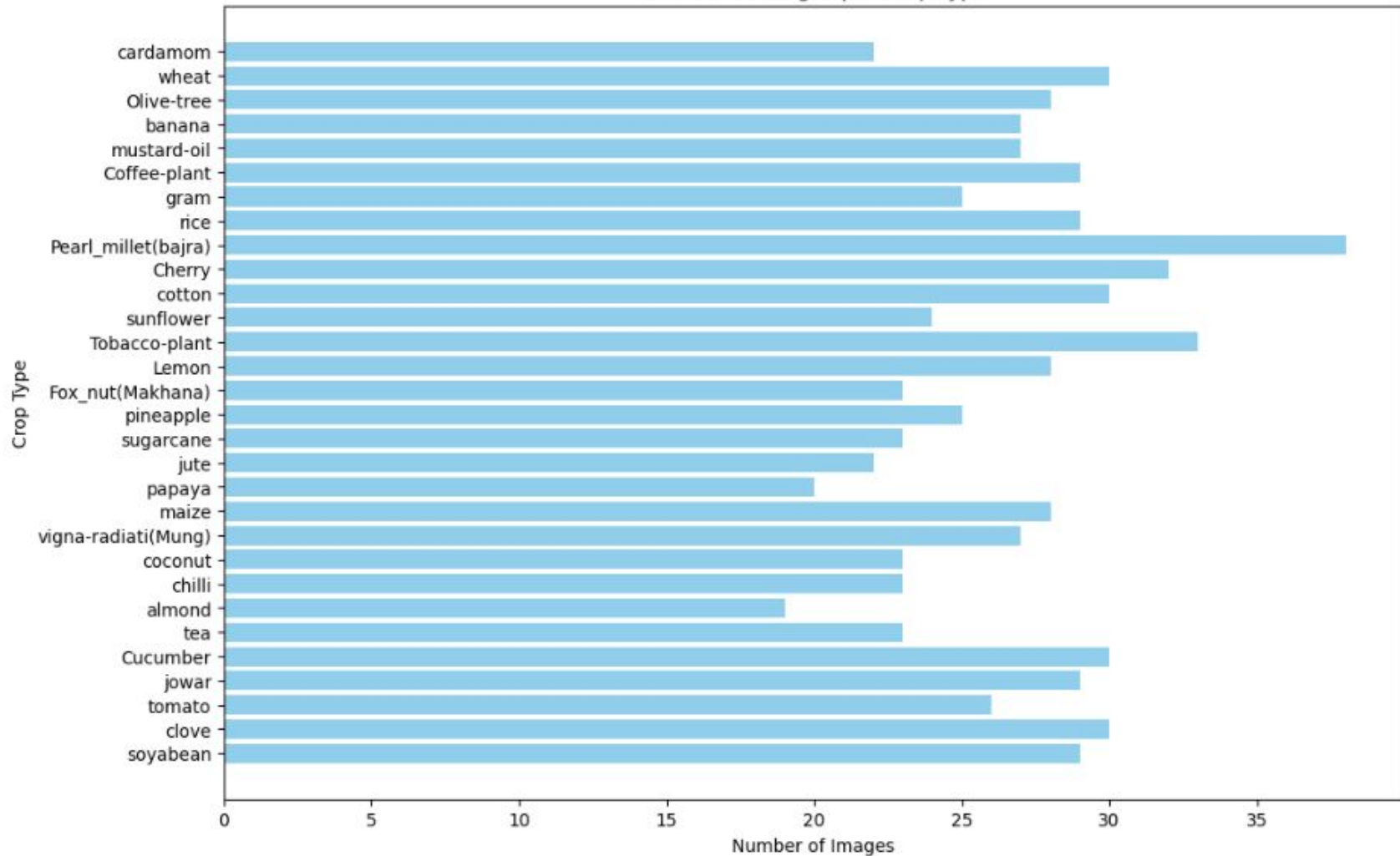
image (21).jpg  
93.57 kB



image (22).jpg  
417.99 kB



Number of Images per Crop Type



# Problem Formulation

Input: Images of agricultural crops.

Output: Classification labels corresponding to crop types (e.g., rice, sugarcane, maize).

## METRICS:

Accuracy	Precision	Recall
F1-Score	ROC-AUC	

## MODELS

Initial model from class example

- Starting point to learn about models for image classification

## MobileNetV2

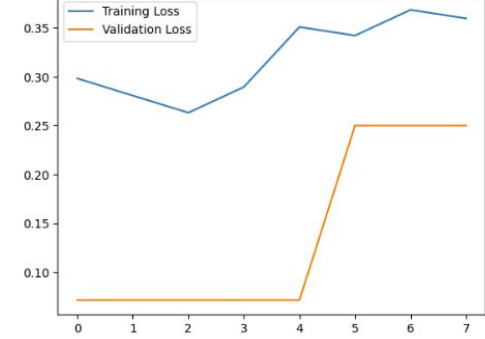
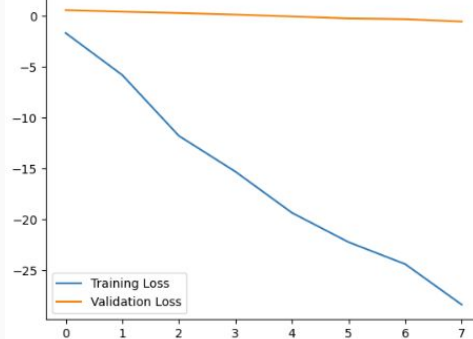
- With and without augmentation
- Flexible and good for scaling especially image classifications

## EfficientNetB3

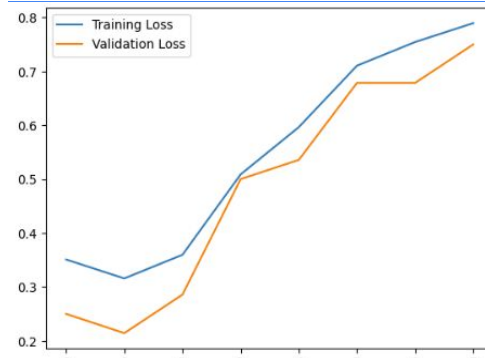
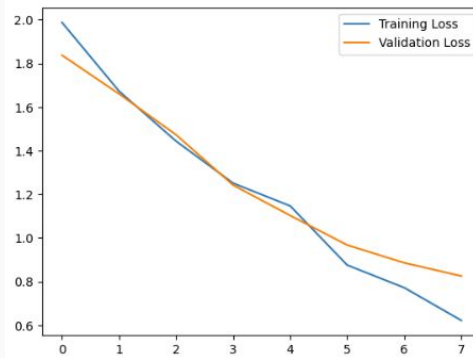
- leverages pre-trained weights from ImageNet to improve image classifying
- Also did this with and without augmentation



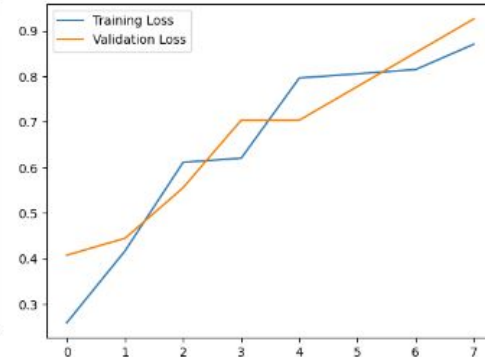
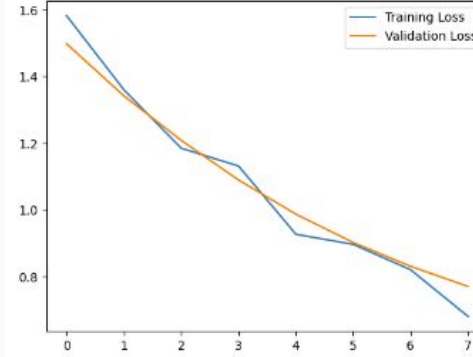
# Initial Model



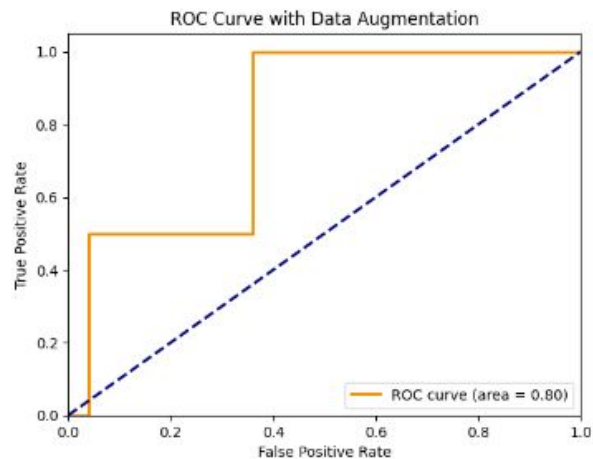
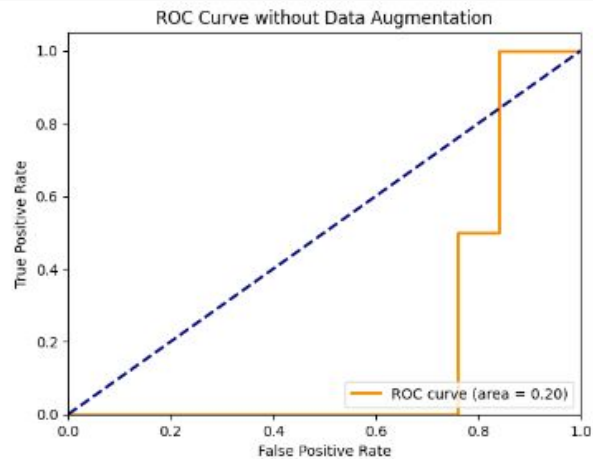
# MobileNetV2



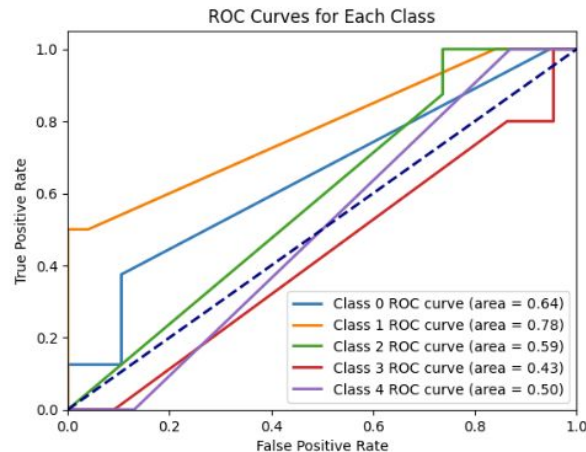
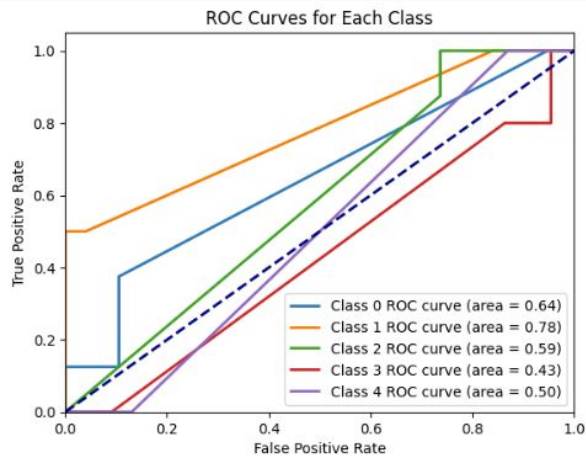
# EfficientNetB3



# MobileNetV2



# EfficientNetB3



Metrics: unfortunately a solution I used to get my models working earlier is not allowing me to correctly produce my metrics