AI Mango Presentation

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OUTLINE

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Methodology

Convolutional Neural Network

Input size: 224 x 224 x 3

Batch size: 32 / 48

Epoch num: 20 to 40

Optimizer: Adam

Learning Rate: 0.001

Loss function: Cross Entropy

NET

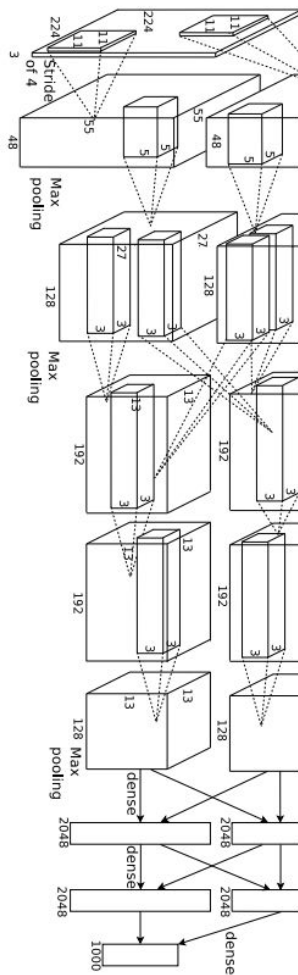## Methodology

AlexNet

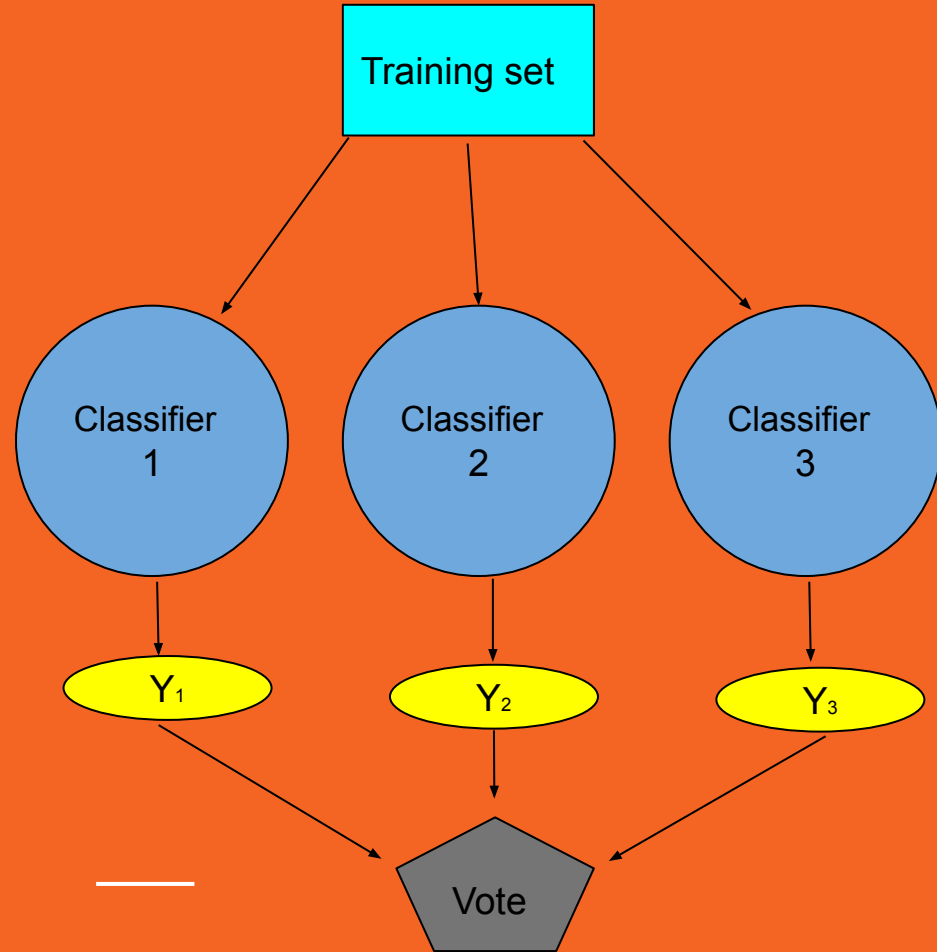Input size: 224 x 224 x 3

Batch size: 16

Epoch num: 30

Optimizer: Adam

Learning Rate: 0.00001

Loss: Cross Entropy

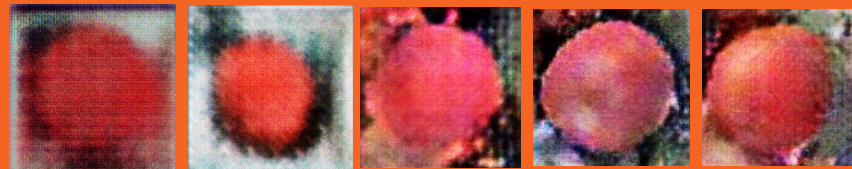# **Methodology**

Ensemble Learning - Voting

Evaluation

Validation set

- Quantity: 800
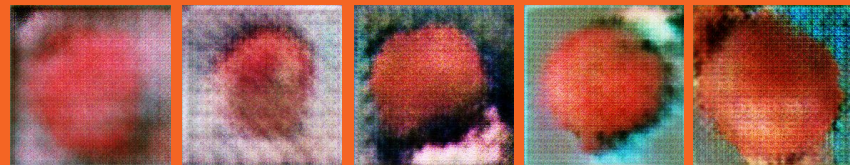 - Class A: 243
  - Class B: 293
  - Class C: 264
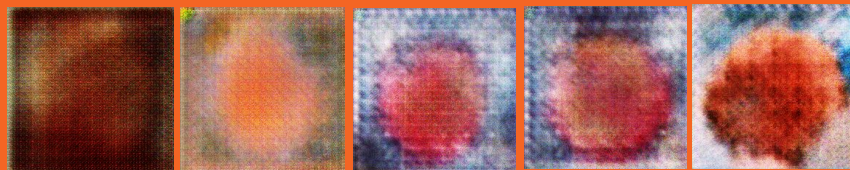
Methodology

Data Augmentation

Group A:

Group B:

Group C:

Test Results

Test set accuracy:

CNN_1 : 76.8%

CNN_2 : 75.4%

CNN_3 : 79.4%

AlexNet : 72.4%

Ensemble learning (CNN_1,2,3): 77.8%

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Demo Results

Misclassified images:

A → B	1
B → C	14

Demo accuracy: 75%

Discussion

- Exhausted reading images in Google Colab
- When training our models, we may encounter accuracy not improving at all. To fix this, we set the learning rate smaller and then run the experiment with different optimizers.
- When validation loss started to increase tremendously, we stopped training in fear of overfitting.

Conclusion

- Unlike general classifiers, we have to divide the same species, mango, into three classes instead of recognizing different species, such as cats and dogs. Thus, what we are going to do is to identify the subtle differences between mangoes.

- Initially, we tried to use ResNet, VGG16 and AlexNet on our project. However, the outcomes of these classifiers performed worse than we had expected beforehand because these models are designed to recognize 1000 classes. Thus, we eventually decided to build the structure of CNN on our own in order to let the model detect more minor differences. In fact, after being modified, the predicted results are better than the original model. More, better than the baseline announced by the official website.

Conclusion

- Task-oriented classification
- Big architecture less efficiency