A Bad Apple In the Bunch

Image analysis of rotten Fruit

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The Process:

Understanding the Business Problem

Acquiring and Processing the Data

Analyzing the Results

Drawing Conclusions

Understanding the Problem

Whole Foods is one of the biggest Grocery Chains in the Country. They have build their brand on providing quality produce at reasonable prices. A company's brand is everything, and so Whole Foods needs a way to ensure that the quality of their produce does not decline.

The Data

The Data for this project Consists of two major datasets containing images of various fruits that are either healthy or in some stage of decay

Mendeley Data:
Over 12,000 images of several fruits in varying states of decay

Kaggle:
Over 18,000 images of various Fruits grouped by either healthy or rotten

kaggle

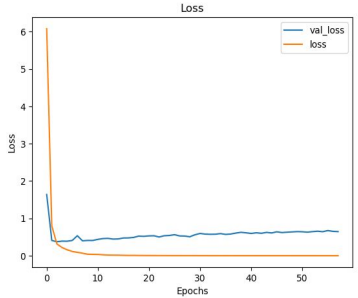
First Model: Neural Networking

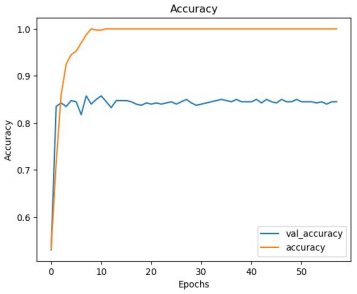
I chose to use neural Networking because I thought it would be the fastest way to get the image recognition done

For my first Neural Network model I kept it as simple as possible so that I could establish a baseline

Tuning the Network

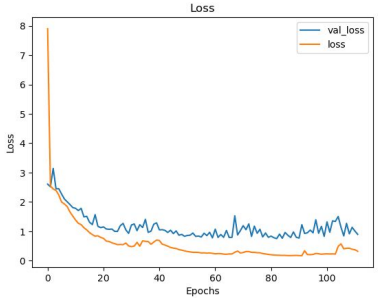
Baseline Model:

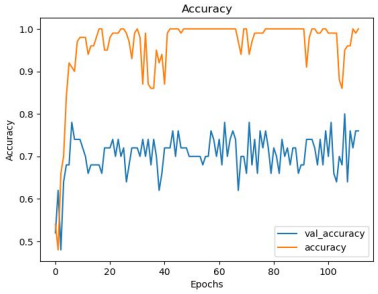




Accuracy = 86.5%
Loss = 0.5217

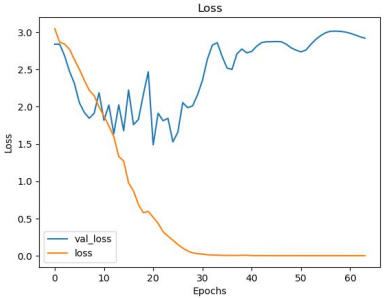
Regularization:

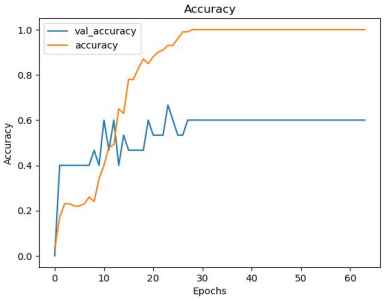




Accuracy = 72.5%
Loss = 1.7339

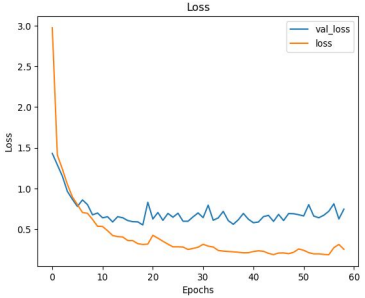
Categorical Classification:

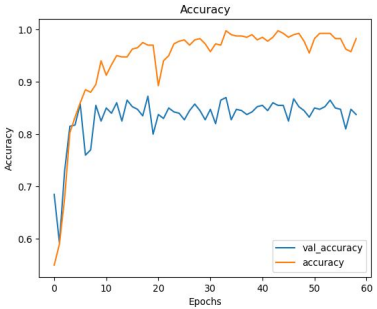




Accuracy = 60%
Loss = 2.9197

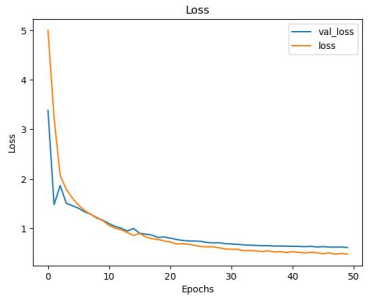
Hyperparameter Tuning:

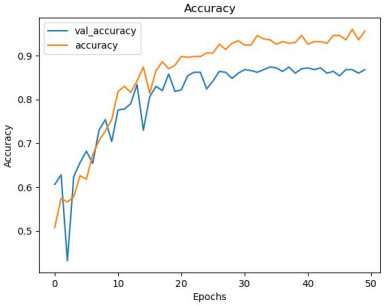




Accuracy = 74%
Loss = 1.39

Final model:





Accuracy = 89%
Loss = 0.546

Final Model

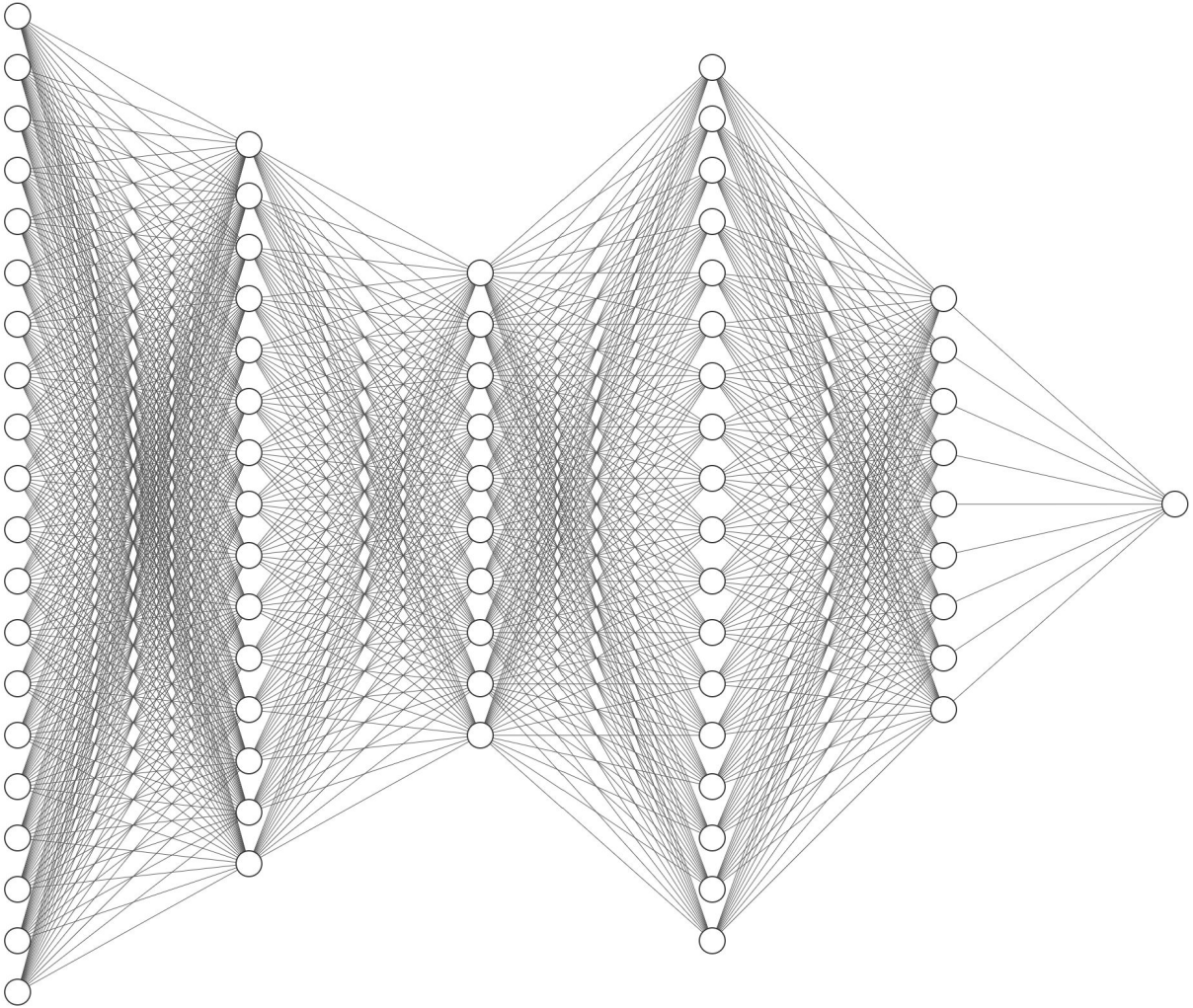
- 2d convolutional layer
- 2d max pooling layer
- Dropout layer
- dense layer
- Dropout layer
- Dense layer
- Dropout layer
- Output layer

Results:

	Accuracy	Loss
Train	94.5%	0.237
Validation	85%	0.675
Test	89.5%	0.546

Conclusions

My model is about 89% accurate based on the 2000 sample that I used



Going Forward

Next Steps:

1. Get a bigger dataset with more advanced alternatives for each original photo
2. Find photos that cover more of the range of states of decay for each kind of rotting fruit
3. Expand the variety of fruits in the dataset to that the model can be used on a wider range of produce
4. Add my model to another established neural network with transfer learning to make my model more accurate

Thank you

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Github: https://github.com/jlharrigan/Is-it-ripe-

linkedIn: www.linkedin.com/in/john-harrigan-994761225

Blog post: https://www.blogger.com/blog/post/edit/6438748702140578492/7796687238122774213