

A decorative graphic on the left side of the slide consisting of two overlapping parallelograms. The front one is blue and the back one is a light green. They are positioned diagonally, with the blue one partially covering the green one.

Deep Learning Workflow

Presented by Jon Tyler

Dataset

This data was initially published on Analytics Vidhya by Intel to host a Image Classification Challenge. Then later uploaded Kaggle.

This Data contains around 25k images of size 150x150 distributed under 6 categories.

Buildings



Sea



Mountain



Street



Forest



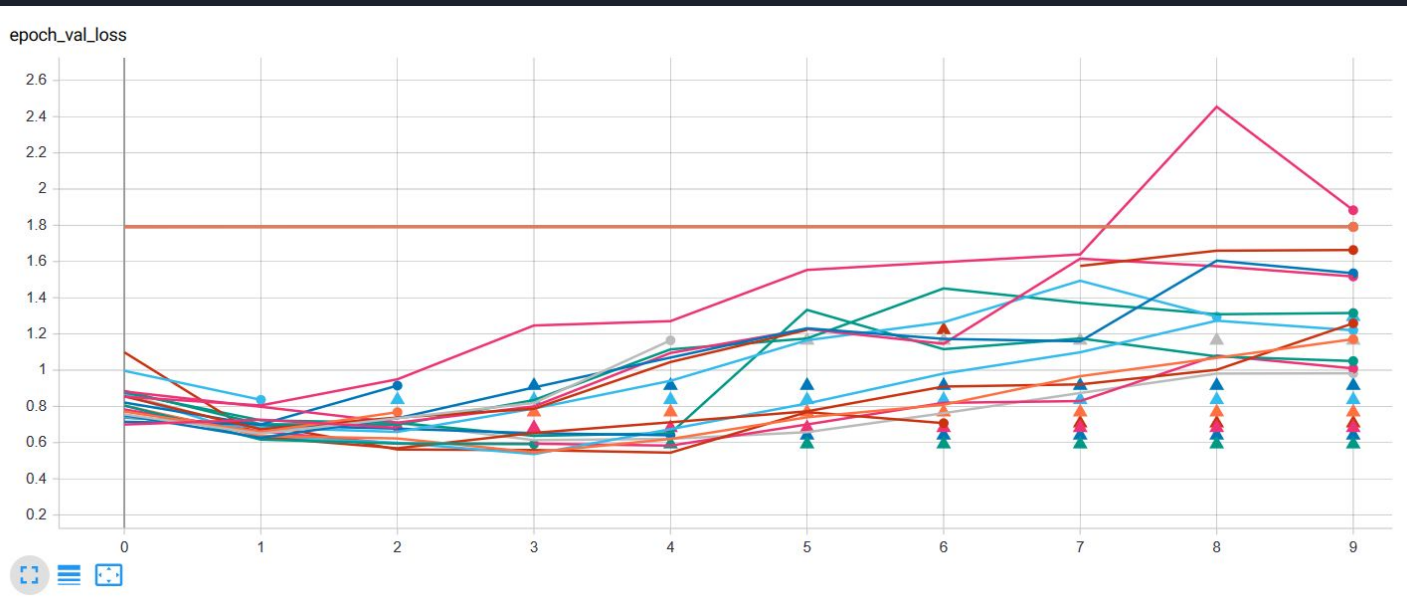
Glacier



Initial Model

An architecture was created to test 27 different models for the dataset

From these results, we isolated early pitfalls in our process and then identified the direction in which to steer our architecture.

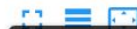
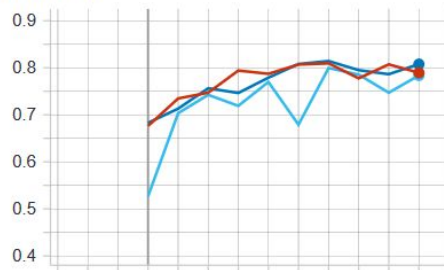


Final Model and Results

We continued to make 12 more iterations to the original framework.

Finally settling on an architecture that results in a **80%** accuracy score.

epoch_val_acc



	Name	Smoothed	Value	Step	Time	Relative
epoch_val_acc	V2-3-conv-128-nodes-3-dense-1559247942	0.7895	0.7895	9	Thu May 30, 17:00:26	31m 10s
epoch_val_acc	V2-3-conv-256-nodes-3-dense-1559250026	0.7838	0.7838	9	Thu May 30, 17:49:54	44m 24s
epoch_val_acc	V2-3-conv-64-nodes-3-dense-1559246278	0.8078	0.8078	9	Thu May 30, 16:25:42	24m 31s

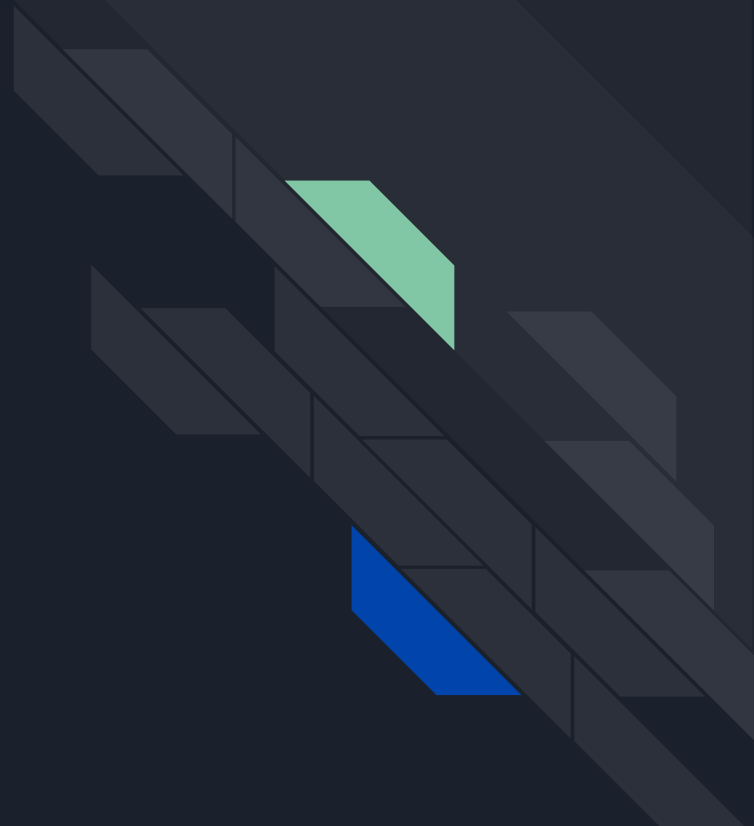
Pre-Trained Models

ResNet50

Microsoft's residual learning framework

VGG16

created by Oxford alumni

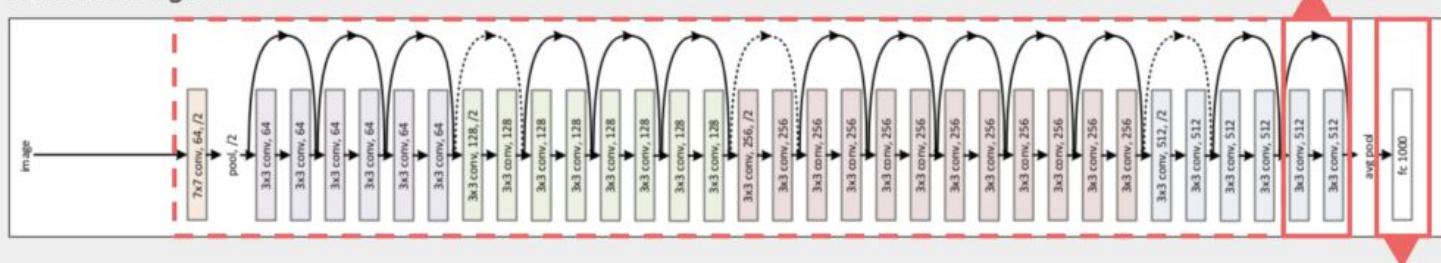


ResNet50

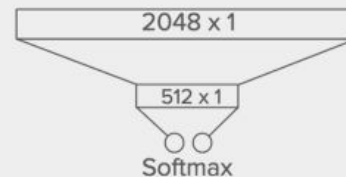
An reasonable amount was spent attempting to merge this pre-trained model to our dataset.

It is *not uncommon* to pivot from one pre-trained model to a different pre-trained model.

ResNet50 Diagram



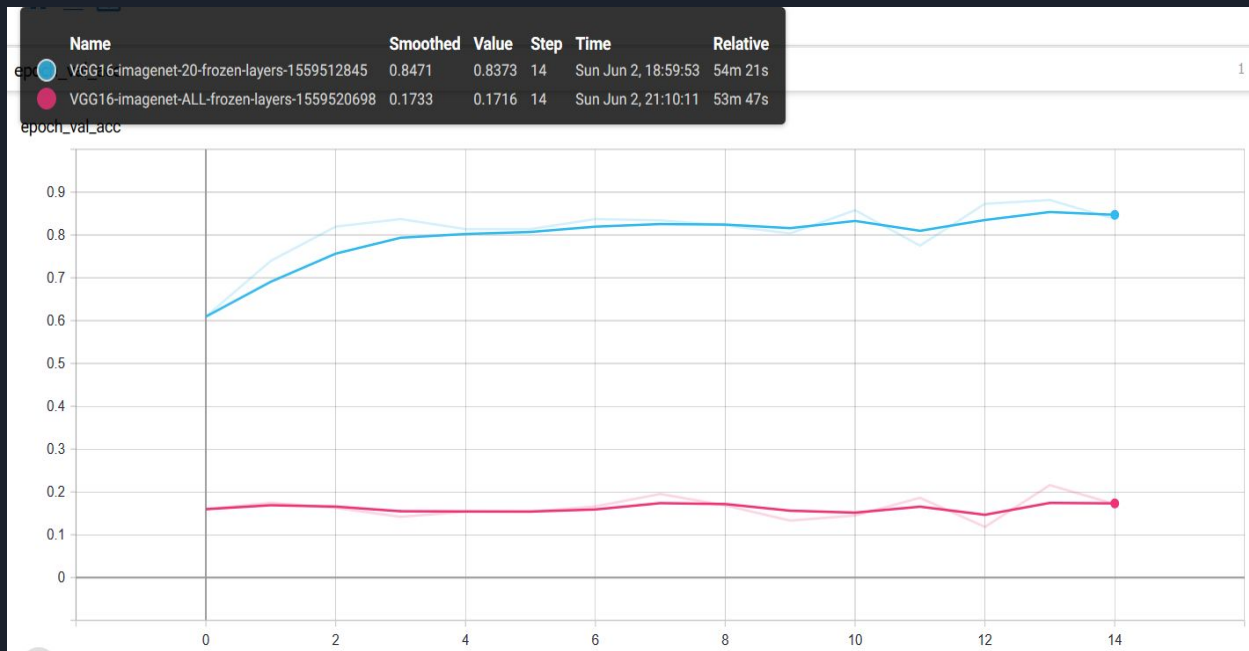
Re-architect fully-connected layers



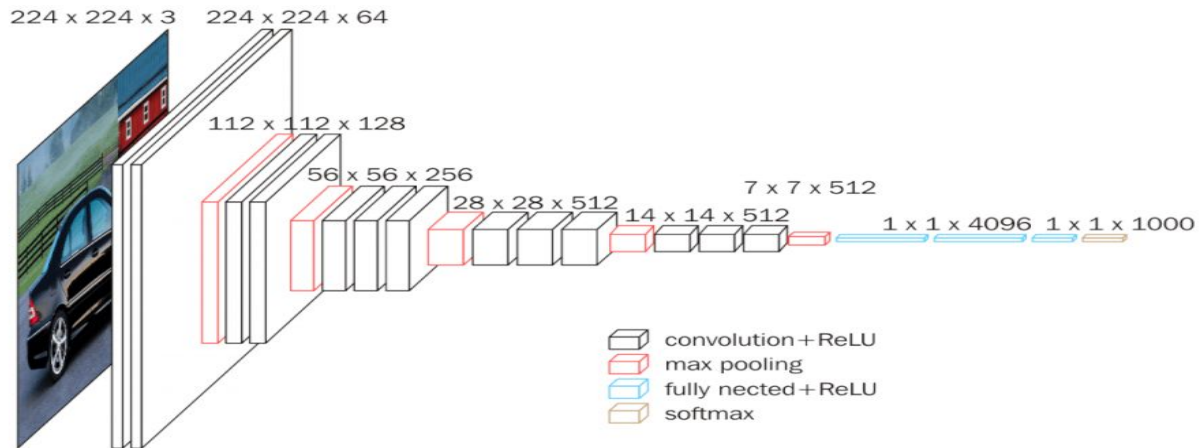
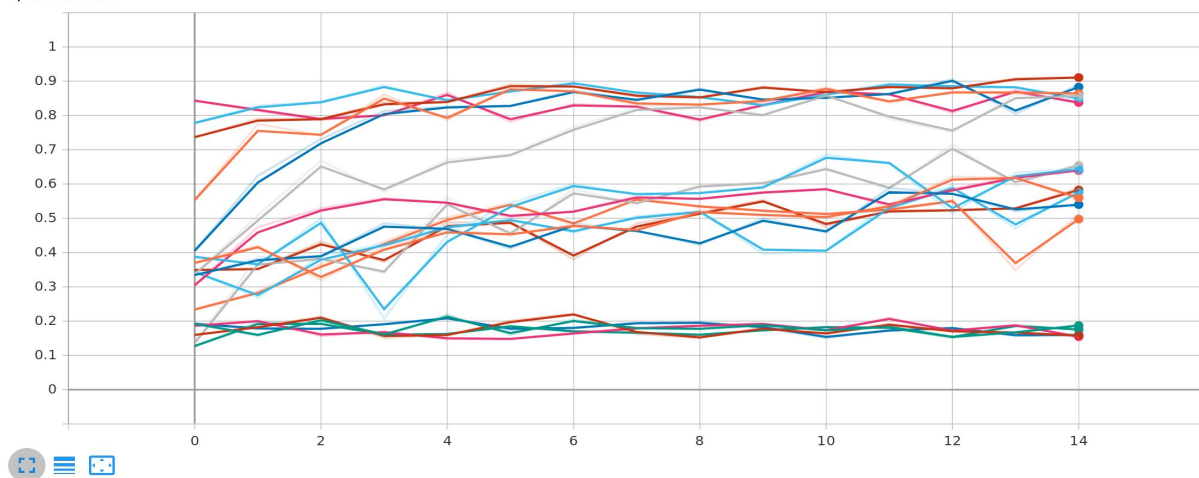
VGG16

Within the initial attempt of running this model, we received a higher training accuracy than our inhouse model.

83.75%
Compared to
80.75%



epoch_val_acc



20 more models were created to extend the VGG16 framework. Resulting in a **91.1% accuracy score**

Next Steps

- Incorporate VGG16 architecture into our inhouse model
- Data augmentation to test robustness
- Scale best model for use in production

