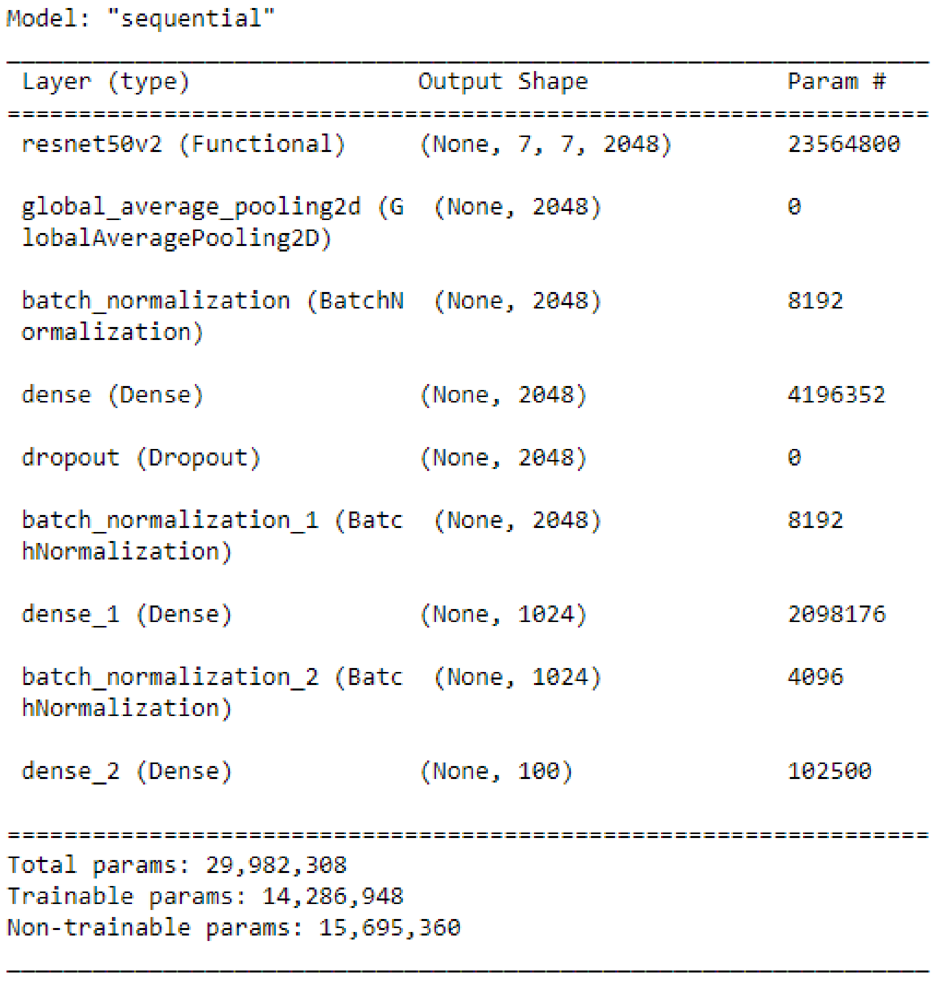
Dataset

100 Sports Classes, 13572 Training Samples, 500 Validation Samples, 500 Test Samples, 224x224 RGB images.

Initial Model

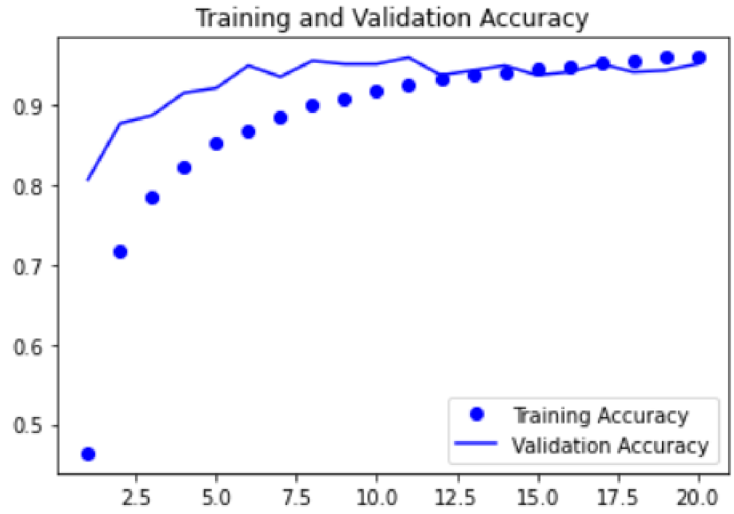
Resnet50 V2 architecture, two fully connected layers and one output layer. Total trainable parameters: 14,286,948. Non-trainable parameters: 15,695,360



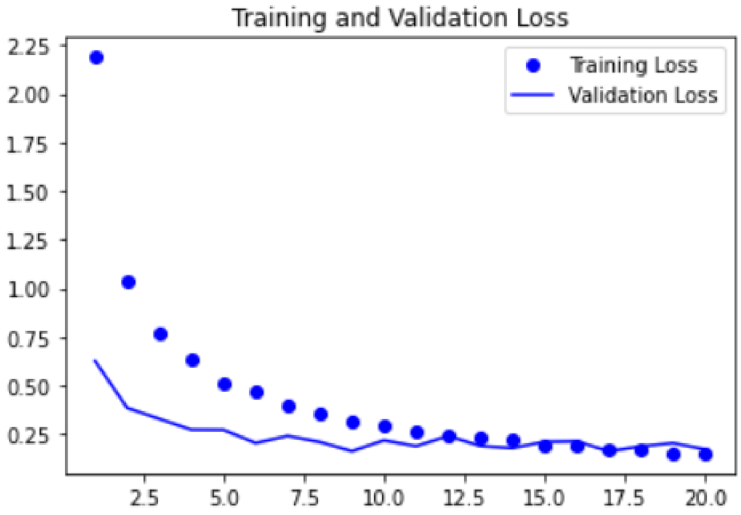
```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #   
=================================================================
 resnet50v2 (Functional)     (None, 7, 7, 2048)        23564800  
                                                                 
 global_average_pooling2d (G  (None, 2048)             0         
 lobalAveragePooling2D)                                          
                                                                 
 batch_normalization (BatchN  (None, 2048)             8192      
 ormalization)                                                   
                                                                 
 dense (Dense)               (None, 2048)              4196352   
                                                                 
 dropout (Dropout)           (None, 2048)              0         
                                                                 
 batch_normalization_1 (Batc  (None, 2048)             8192      
 hNormalization)                                                 
                                                                 
 dense_1 (Dense)             (None, 1024)              2098176   
                                                                 
 batch_normalization_2 (Batc  (None, 1024)             4096      
 hNormalization)                                                 
                                                                 
 dense_2 (Dense)             (None, 100)               102500    
                                                                 
=================================================================
Total params: 29,982,308
Trainable params: 14,286,948
Non-trainable params: 15,695,360
_________________________________________________________________
```

Loss: Categorical-Crossentropy
Optimizer: RMSprop with a learning rate of 0.0001
Metric: Categorical Accuracy
Train Batch Size: 16, **Validation Batch Size:** 16

Train and Validation Accuracy



Train and Validation Los



Observation & Conclusion

Using custom neural network architectures, we couldn’t get good performance for the model. The dataset was too small for the custom neural network to do well. Complex model was easily overfitting, simple model was not able to catch important features from the data. Convolutional Neural Networks have a great option for such cases, which is transfer learning. It uses pre-trained weights calculated from another task to help solve a different (but similar) problem. Using weights from ‘imagenet’, deleting bottom layers, adding new ones, and training them on the new dataset, we were able to reach 97% test accuracy, which is a very good result for such small datasets.