

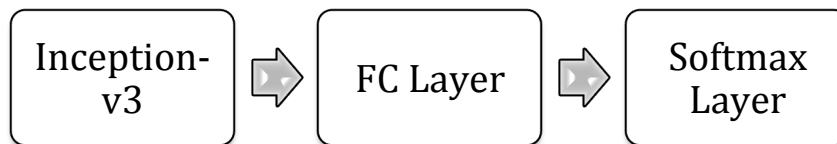
6000B Project 2 Report

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1. Model Structure

We use transfer learning to build the flower classifier model. The base model is Inception-v3 model that can classify 1000 classes for images in ImageNet with accuracy higher than 95%. To build our new model, we firstly remove the softmax layer in Inception-v3, freeze all other layers except for the last layer; then we add a new fully-connected layer to the model and also a softmax layer with 5 classes. While training the model, we only train the last layer of Inception-v3 and our newly added layers.

The structure of our model can be shown in the graph below:



2. Training Process

Our training process mainly follows the steps below:

(1) Preprocessing

Since the flower images have different size, we resize all the images into the shape (299, 299), which matches the image size input for inception-v3 model. Then we convert all images into array format using python Image package. Finally we separate the training and validation datasets.

(2) Training the model

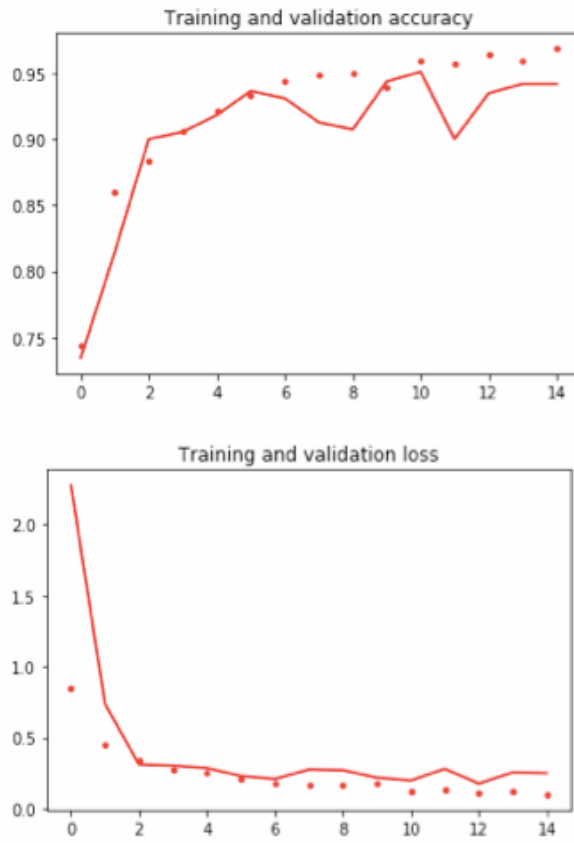
We build the model by combining the inception-v3 model, a fully-connected layer, and a Softmax layer with 5 classes. To speed up the training process, we use Mini-batch method with a batch size of 16. For optimizer, we use Adaptive Moment Estimation (Adam) to update the parameters. We set the number of iterations to be 15.

(3) Predicting test data

For the test data, we firstly resize the images to match the training data size and convert the image to array. Then we use the trained model to classify the test data and analysis the result.

Keras is used for modeling training and testing.

3. Result Evaluation



As we can see from the graph, after 5 iterations, our model's parameters converge. The training accuracy can achieve 97% and the validation accuracy can achieve 93%.