

# CS412 HW4

## Nofil Iqbal

[https://colab.research.google.com/drive/1XcFbJNS96giaVtg25VRC0SBfa\\_fhAKLf?usp=sharing](https://colab.research.google.com/drive/1XcFbJNS96giaVtg25VRC0SBfa_fhAKLf?usp=sharing)

### **Introduction:**

In this hw, we were asked to categorize images of celebrities into Male or Female classes, using deep learning and transfer learning with the pre-trained model VGG-16, and tailoring it to our needs.

### **Dataset:**

The dataset consisted of 30000 RGB pictures of celebrities' faces that was split into 80%(train), 10%(validation) and 10%(test). Below are some samples:



### **Methodology:**

In this hw, a pre-trained VGG-16 model was used as a base and adapted for gender classification. The pre-trained model's convolutional layers were frozen to retain the learned features, and additional layers were added on top to perform gender classification. The model was trained on a training set and evaluated on a validation set, and finally tested on a separate

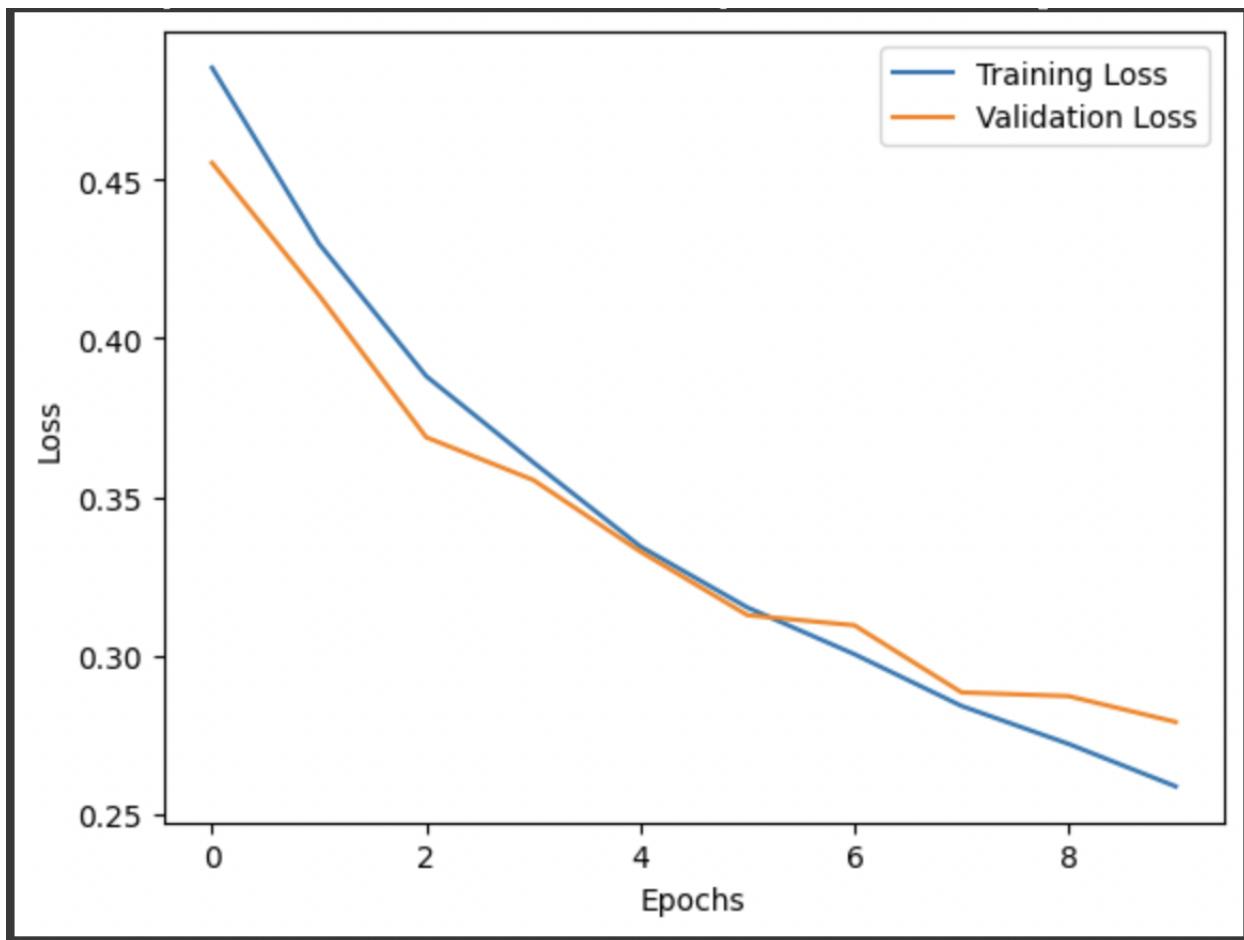
test set to assess its performance. The accuracy of the model was measured using the accuracy\_score metric from scikit-learn, the optimizer used was SGD, and I used ReduceLROnPlateau to counter overfitting.

### **Experiments:**

I tried different learning rates and batch sizes to find the best fine-tuning for my problem, but soon I encountered a problem with my google colab as it ran out of resources. After that, I used another account to run further trials, but had to limit them so that I do not run into the same issue again.

Below is the table and chart for the best validation accuracy I managed to get:

Learning Rate	Epoch	Batch Size	Best Valid Accuracy
0.001	10	8	0.9163



### **Conclusion:**

Finally, I tested my classifier on the test dataset and the final accuracy it gave was 51.2%