

GNR638
MINI Project : 1
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We have experimented with the CUB 2011 dataset using various ImageNet pretrained models. We have trained the dataset first using ResNet18(Epoch 11) for greater than 10 million parameters, then we got slightly less validation accuracy than ResNet18 (Epoch_11) with around 7 million parameters. **The most efficient model is EfficientNet_b0(with 20 epoch), EfficientNet_b2(with 20 epoch)**

We have trained the CUB 2011 dataset on following ImageNet pretrained models:

- 1) ResNet 18:
- 2) EfficientNet_b0
- 3) EfficientNet_b2

1) **ResNet 18:** I have used 4 fully connected layers with input size of:

First layer: (512,1024)

Second layer: (1024,2048)

Third layer: (2048,2048)

Fourth layer: (2048, 200)

Activation function: SiLU

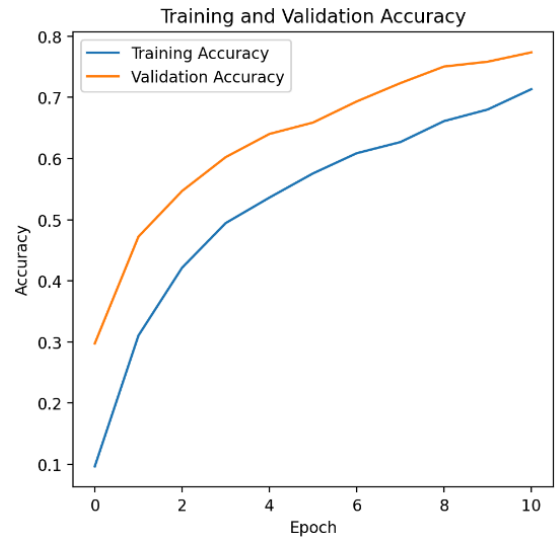
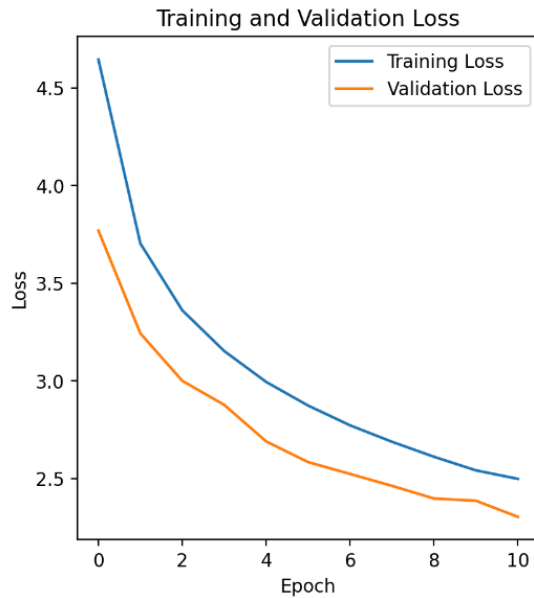
Total number of trainable parameters: 7230664 (~7M <10M)

Total number of Epochs = 11

Best Validation Accuracy: 78.337%

Overall Test Accuracy: 78%

Training Time: 5m 11s



2) **ResNet 18:** I have used 4 fully connected layers with input size of:

First layer: (512,1024)

Second layer: (1024,2048)

Third layer: (2048,2048)

Fourth layer: (2048, 200)

Activation function: SiLU

Total number of trainable parameters: 7230664 (~7M <10M)

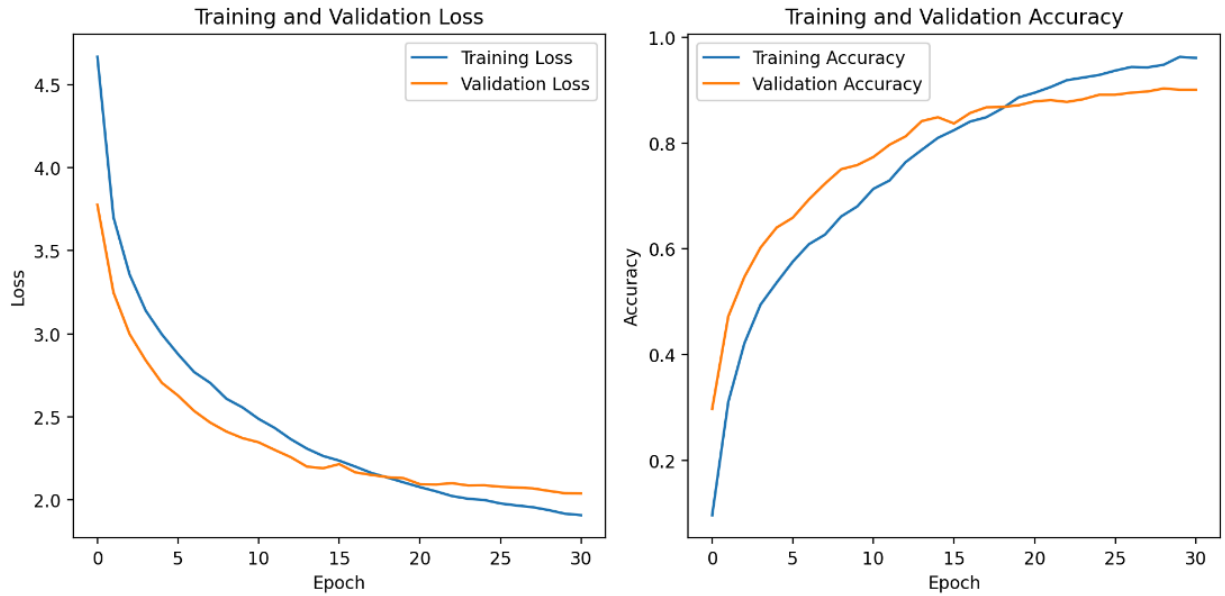
Total number of Epochs = 20

Best Validation Accuracy: 87.5%

Overall Test Accuracy: 87%

Training Time: 9m 24s

Resnet_18_20Epoch plot:



3) **EfficientNet_b0**: I have used 3 fully connected layers with input size of:

First layer: (1280,2048)

Second layer: (2048,2048)

Third layer: (2048, 200)

Activation function: SiLU

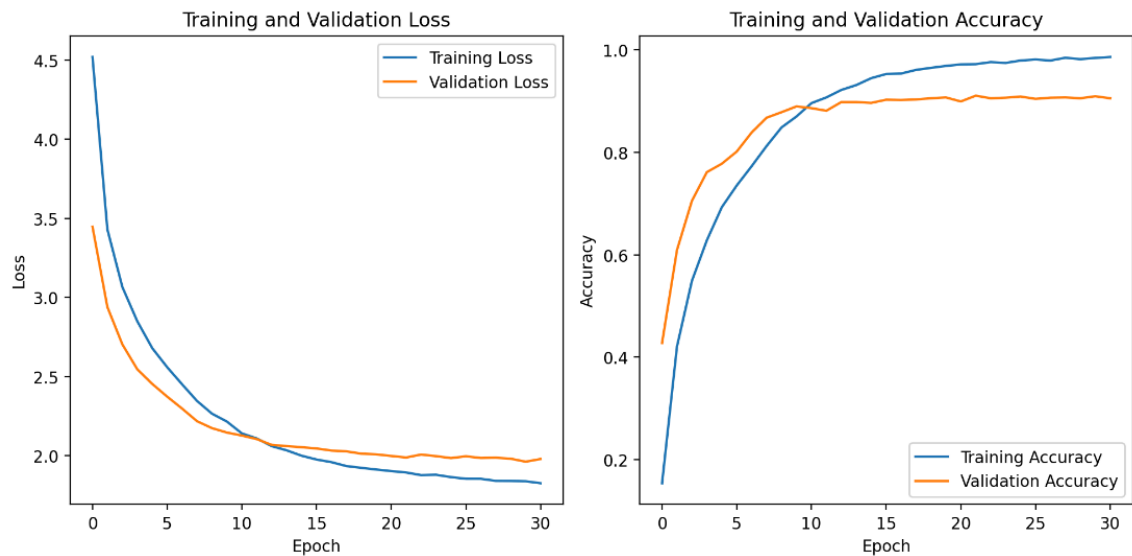
Total number of trainable parameters: 7229640 (~7M <10M)

Total number of Epochs = 11

Best Validation Accuracy: 91.11%

Overall Test Accuracy: 91%

Training Time: 5m 22s



4) **EfficientNet_b0** : I have used 3 fully connected layers with input size of:

First layer: (1280,2048)

Second layer: (2048,2048)

Third layer: (2048, 200)

Activation function: SiLU

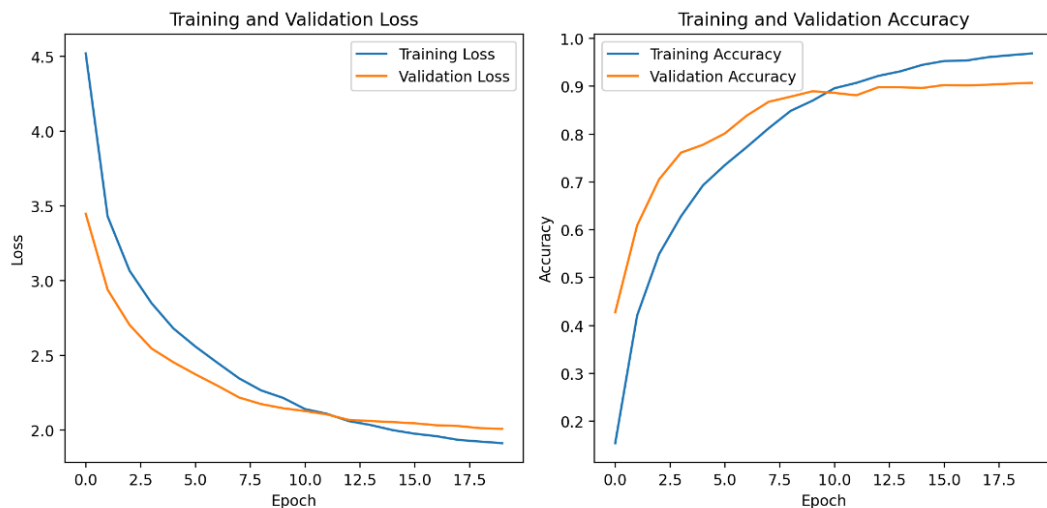
Total number of trainable parameters: 7229640 (~7M <10M)

Total number of Epochs = 20

Best Validation Accuracy: 91.45%

Overall Test Accuracy: 91%

Training Time: 9m 42s



5) **EfficientNet_b2**: I have used 3 fully connected layers with input size of:

First layer: (1408,2048)

Second layer: (2048,2048)

Third layer: (2048, 200)

Activation function: SiLU

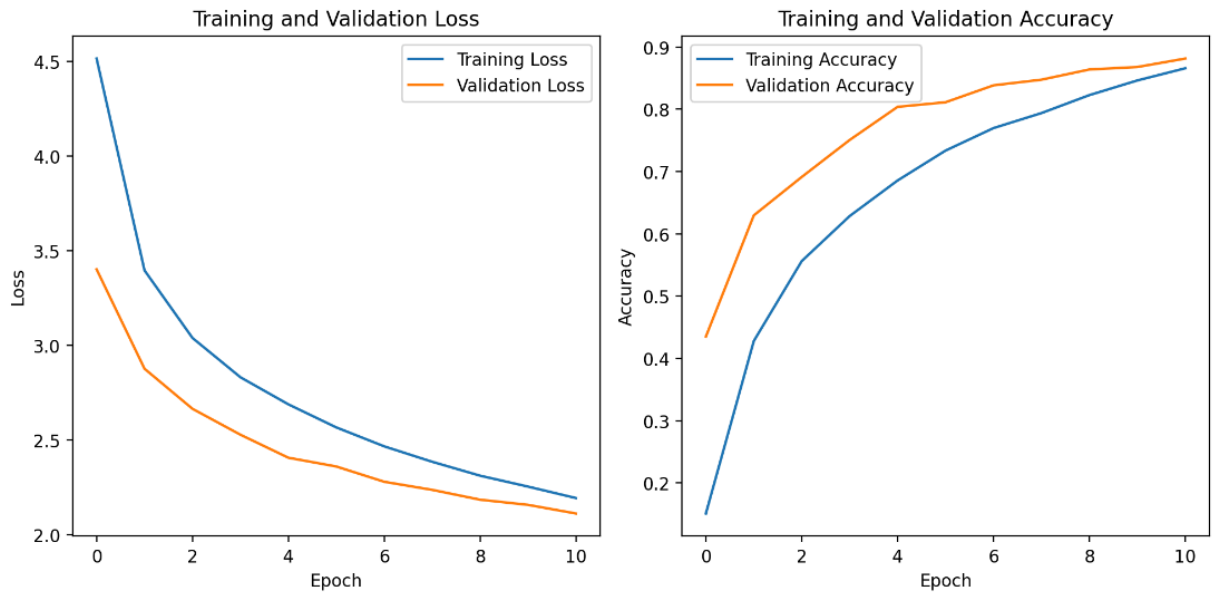
Total number of trainable parameters: 7491784 (~7M <10M)

Total number of Epochs = 11

Best Validation Accuracy: 87.104%

Overall Test Accuracy: 87%

Training Time: 5m 32s



6) **EfficientNet_b2**: I have used 3 fully connected layers with input size of:

First layer: (1408,2048)

Second layer: (2048,2048)

Third layer: (2048, 200)

Activation function: SiLU

Total number of trainable parameters: 7229640 (~7M <10M)

Total number of Epochs = 20

Best Validation Accuracy: 91.11%

Overall Test Accuracy: 89%

Training Time: 10m 5s

EfficientNet_b2_20Epochs plot:

