各種實驗因素分析(Ablation Study)

Type	1	2	3	4
Augmentation	No	No	Yes	Yes
Loss function	CrossEntropy	FocalLoss	CrossEntropy	FocalLoss
Val acc	0.90325	0.93780	0.94740	0.95221
Test acc(Kaggle)	0.65333	0.98666	0.97333	1.0

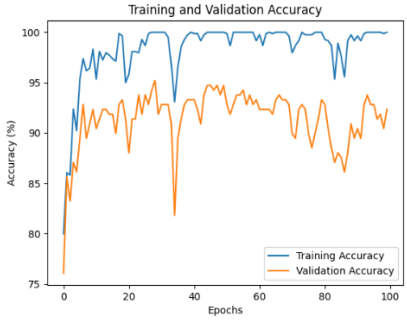
對於少量資料集，我覺得用這樣大小的模型即可，太大的話容易 overfitting

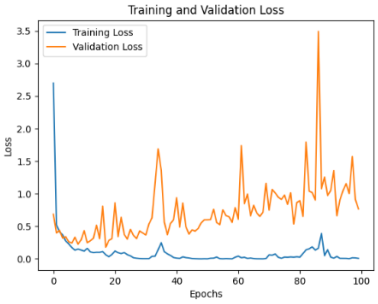
Model structure:

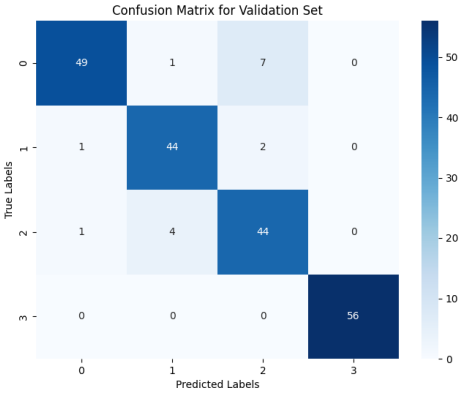
```
----------------------------------------------------------------
        Layer (type)               Output Shape         Param #
================================================================
            Conv2d-1         [-1, 64, 224, 224]           1,792
              ReLU-2         [-1, 64, 224, 224]               0
         MaxPool2d-3         [-1, 64, 112, 112]               0
            Conv2d-4        [-1, 128, 112, 112]          73,856
              ReLU-5        [-1, 128, 112, 112]               0
         MaxPool2d-6          [-1, 128, 56, 56]               0
            Conv2d-7          [-1, 256, 56, 56]         295,168
              ReLU-8          [-1, 256, 56, 56]               0
         MaxPool2d-9          [-1, 256, 28, 28]               0
           Linear-10                [-1, 1024]     205,521,920
             ReLU-11                [-1, 1024]               0
          Dropout-12                [-1, 1024]               0
           Linear-13                   [-1, 4]           4,100
================================================================
Total params: 205,896,836
Trainable params: 205,896,836
Non-trainable params: 0
----------------------------------------------------------------
Input size (MB): 0.57
Forward/backward pass size (MB): 96.49
Params size (MB): 785.43
Estimated Total Size (MB): 882.50
----------------------------------------------------------------
```

Accuracy curve / Loss curve / Confusion matrix:

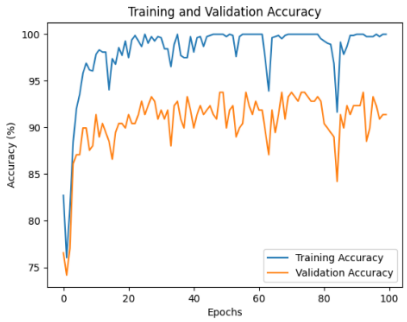
Type 1:

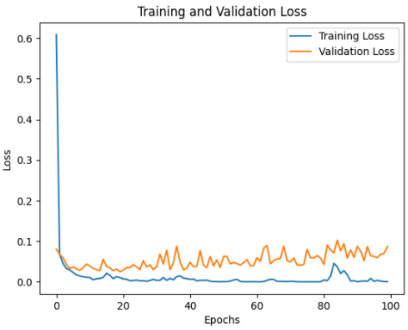

Training and Validation Accuracy
Accuracy (%)
Epochs
Training Accuracy
Validation Accuracy

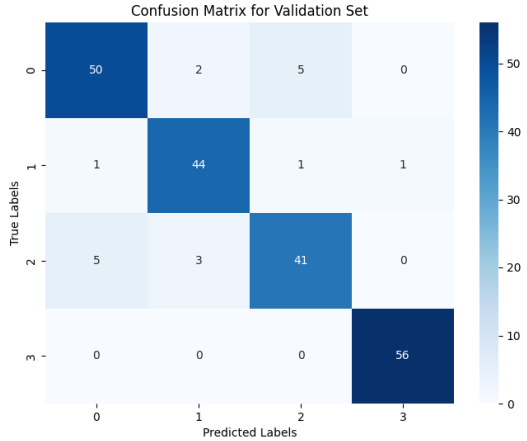

Training and Validation Loss
Loss
Epochs
Training Loss
Validation Loss


Confusion Matrix for Validation Set
True Labels
Predicted Labels
49 1 7 0
1 44 2 0
1 4 44 0
0 0 0 56

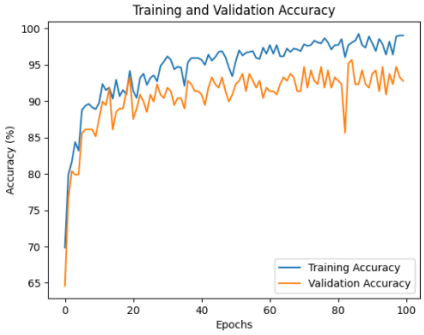
Type 2:


Training and Validation Accuracy
Accuracy (%)
Epochs
Training Accuracy
Validation Accuracy

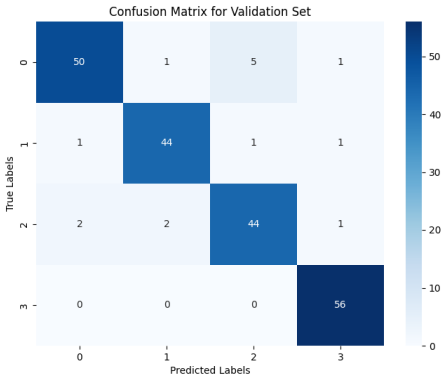

Training and Validation Loss
Loss
Epochs
Training Loss
Validation Loss


Confusion Matrix for Validation Set
True Labels
Predicted Labels
50 2 5 0
1 44 1 1
5 3 41 0
0 0 0 56

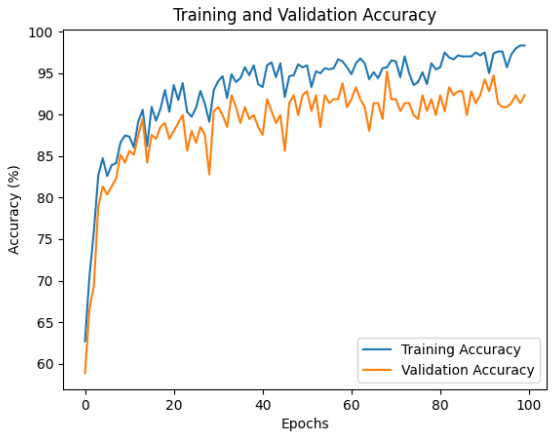
Type 3:

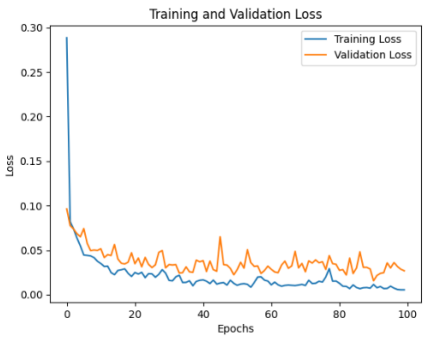

Training and Validation Accuracy
Accuracy (%)
Epochs
Training Accuracy
Validation Accuracy

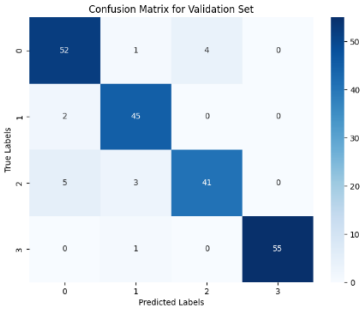

Training and Validation Loss
Loss
Epochs
Training Loss
Validation Loss


Confusion Matrix for Validation Set
True Labels
Predicted Labels
50 1 5 1
1 44 1 1
2 2 44 1
0 0 0 56

Type 4:


Training and Validation Accuracy
Accuracy (%)
Epochs
Training Accuracy
Validation Accuracy


Training and Validation Loss
Loss
Epochs
Training Loss
Validation Loss


Confusion Matrix for Validation Set
True Labels
Predicted Labels
52 1 4 0
2 45 0 0
5 3 41 0
0 1 0 55

結果分析

可以發現 Data Augmentation 跟 FocalLoss 都使用的情況下，模型的表現最好。