ML Hw3 Report

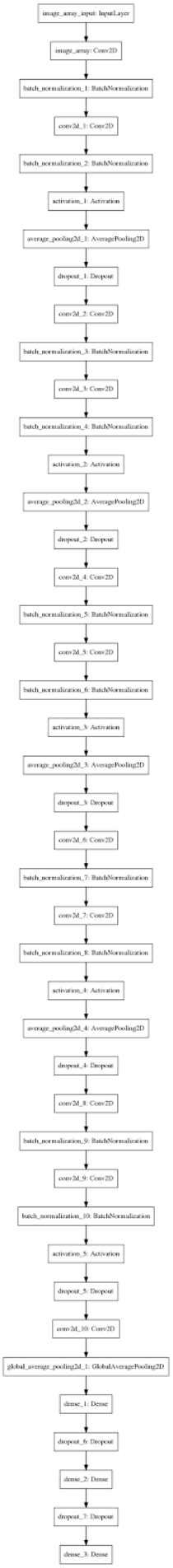
P1: Build Convolution Neural Network (1%)

Model Summary(部分省略):

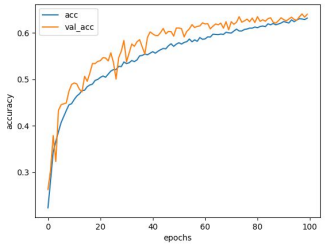
Layer (type)	Output Shape	Param #
image_array (Conv2D)	(None, 48, 48, 16)	1312
batch_normalization_1 (Batch	(None, 48, 48, 16)	64
conv2d_1 (Conv2D)	(None, 48, 48, 16)	20752
batch_normalization_2 (Batch	(None, 48, 48, 16)	64
activation_1 (Activation)	(None, 48, 48, 16)	0
average_pooling2d_1 (Average	(None, 24, 24, 16)	0
dropout_1 (Dropout)	(None, 24, 24, 16)	0
…		
conv2d_8 (Conv2D)	(None, 3, 3, 256)	295168
batch_normalization_9 (Batch	(None, 3, 3, 256)	1024
conv2d_9 (Conv2D)	(None, 3, 3, 256)	590080
batch_normalization_10 (Batc	(None, 3, 3, 256)	1024
activation_5 (Activation)	(None, 3, 3, 256)	0
dropout_5 (Dropout)	(None, 3, 3, 256)	0
conv2d_10 (Conv2D)	(None, 3, 3, 7)	16135
global_average_pooling2d_1 (	(None, 7)	0
dense_1 (Dense)	(None, 256)	2048
dropout_6 (Dropout)	(None, 256)	0
dense_2 (Dense)	(None, 128)	32896
dropout_7 (Dropout)	(None, 128)	0
dense_3 (Dense)	(None, 7)	903

Total params: 1,278,590
Trainable params: 1,276,606
Non-trainable params: 1,984

Model Plot:(On the right)



Training procedure:



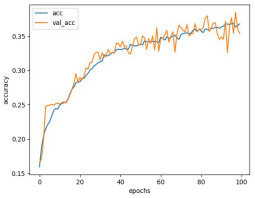
P2: Build Deep Neural Network (1%)

DNN Model Summary(部分省略):

Layer (type)	Output Shape	Param #
dense_1 (Dense)	(None, 480)	1106400
dropout_1 (Dropout)	(None, 480)	0
dense_2 (Dense)	(None, 240)	115440
.....		
dense_4 (Dense)	(None, 100)	12900
dropout_4 (Dropout)	(None, 100)	0
dense_5 (Dense)	(None, 70)	7070
dropout_5 (Dropout)	(None, 70)	0
dense_6 (Dense)	(None, 48)	3408
dropout_6 (Dropout)	(None, 48)	0
dense_7 (Dense)	(None, 7)	343

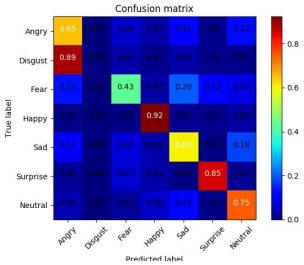
Total params: 1,276,409
Trainable params: 1,276,409
Non-trainable params: 0

Training procedure:



DNN使用一樣參數時，效果差恨多。Accuracy只有大概35%

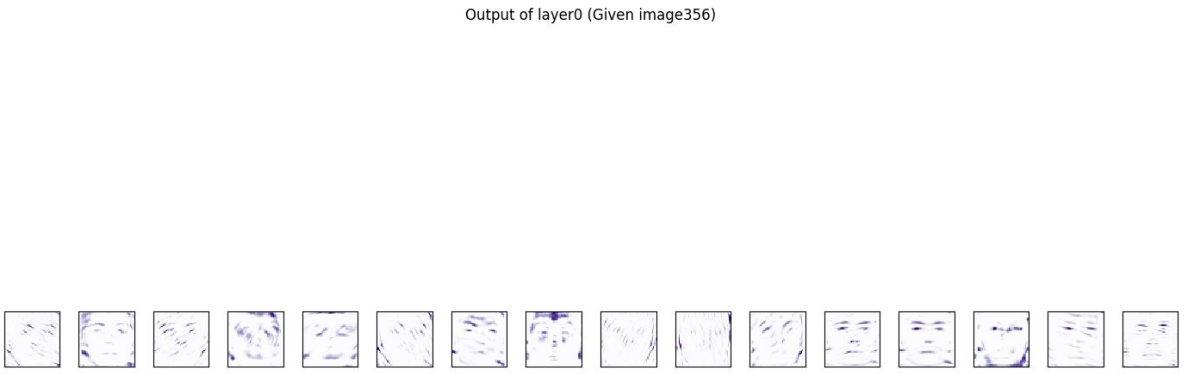
P3: Analyze the Model by Confusion Matrix (1%)



不知道為什麼第二個class 的output完全是0，其他大概都是正常運作。

P4: Analyze the Model by Plotting the Saliency Map (1%)

P5: Analyze the Model by Visualizing Filters (1%)



選擇visualize 第一個activation layer.