

1. CNN 模型：

```

40 #training_data = (training_data - np.mean(training_data,axis = 0))/np.std(training_data,axis = 0)
41
42 model = Sequential()
43 model.add(Convolution2D(32,3,3,input_shape=(48,48,1)))
44 model.add(Activation('relu'))
45 model.add(Convolution2D(32,3,3))
46
47 model.add(Activation('relu'))
48 model.add(MaxPooling2D((2, 2)))
49
50 model.add(Convolution2D(64,3,3))
51 model.add(Activation('relu'))
52 model.add(Convolution2D(64,3,3))
53 model.add(Activation('relu'))
54 model.add(MaxPooling2D((2, 2)))
55 model.add(Convolution2D(128,3,3))
56 model.add(Activation('relu'))
57 model.add(Convolution2D(128,3,3))
58
59 model.add(Activation('relu'))
60
61 # Fully connected part
62 model.add(Flatten())
63 model.add(Dense(output_dim=1000))
64 model.add(Activation('relu'))
65 model.add(Dense(100))
66 model.add(Activation('relu'))
67 model.add(Dense(num_classes))
68 model.add(Activation('softmax'))
69 epochs = 30
70 model.compile(loss='categorical_crossentropy',optimizer='adadelta',metrics=['accuracy'])
71 model.summary()
72 # Fit the model
73 datagen = ImageDataGenerator(width_shift_range=0.2,height_shift_range=0.2,horizontal_flip=True)

```

Convolution2D 6 層

分別為 32 32 64 64 128 128 dense 為 100 1000

準確率大約為 62%左右，經過四次的 training，把四次的結果做 voting 即可
 提升至 65%

2. DNN 模型：

扣除掉 CNN 的部分

```

Using TensorFlow backend.
3.py:41: UserWarning: Update your `Dense` call to the Keras 2 API: `Dense(units=150)`
  model.add(Dense(output_dim=150))

```

Layer (type)	Output Shape	Param #
flatten_1 (Flatten)	(None, 2304)	0
dense_1 (Dense)	(None, 150)	345750
activation_1 (Activation)	(None, 150)	0
dropout_1 (Dropout)	(None, 150)	0
dense_2 (Dense)	(None, 20)	3020
activation_2 (Activation)	(None, 20)	0
dense_3 (Dense)	(None, 7)	147
activation_3 (Activation)	(None, 7)	0

```

Total params: 348,917
Trainable params: 348,917
Non-trainable params: 0

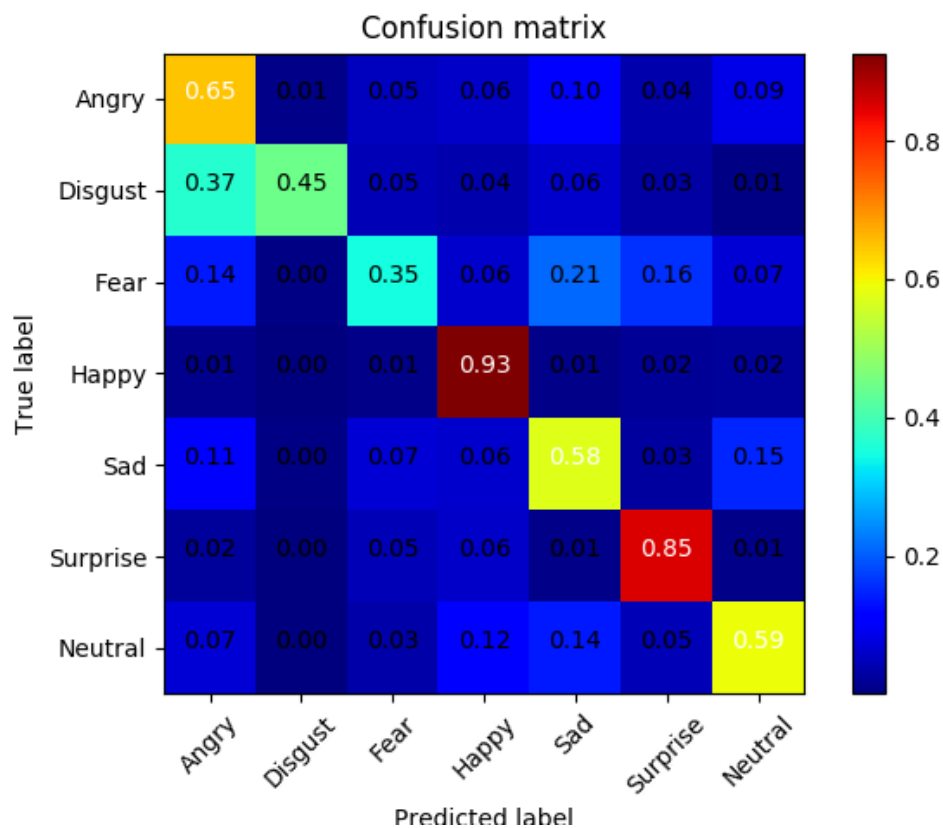
Train on 22967 samples, validate on 5742 samples
Epoch 1/30
2017-05-04 12:30:52.787765: W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use SSE4.1 instructions, but these are available on your machine and could speed up CPU computations.
2017-05-04 12:30:52.787829: W tensorflow/core/platform/cpu_feature_guard.cc:45] The TensorFlow library wasn't compiled to use SSE4.1 instructions, but these are available on your machine and could speed up CPU computations.

```

與 cnn 不同在於他不用去跑 mask filter 的圖片,並且因為 dense 的部分可以做

平行運算，因此速度會非常快

3.



disgust & angry, sad & fear 容易搞混

4. 主要 focus 在臉部表情，五官

