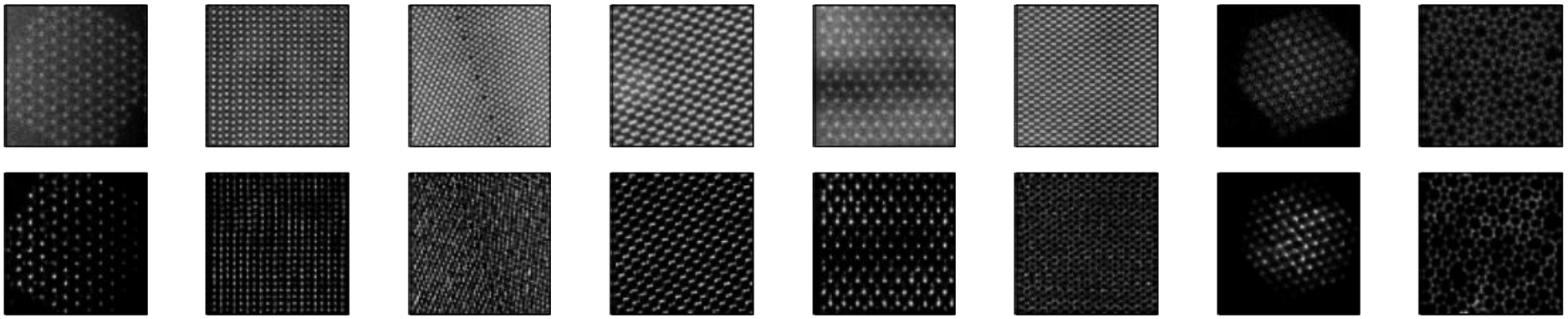
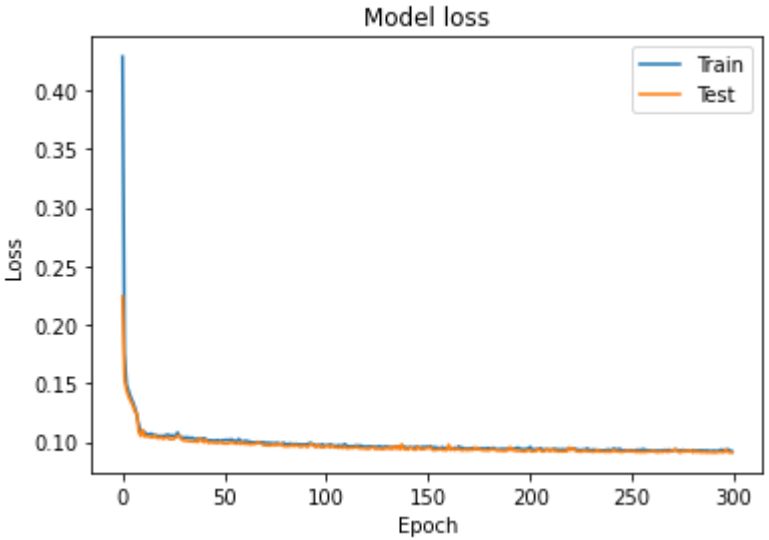
Denoising-autoencoder





Loss = binary_crossentropy
activation= sigmoid
2層 架構
Filters = [32,32]
Epoch = 300

學到的事情

在colab上做訓練，在讀入圖片時，無法直接按照編號牌好，所以要將照片排好對齊後，訓練才有效，不然題目和答案兩個會不一樣

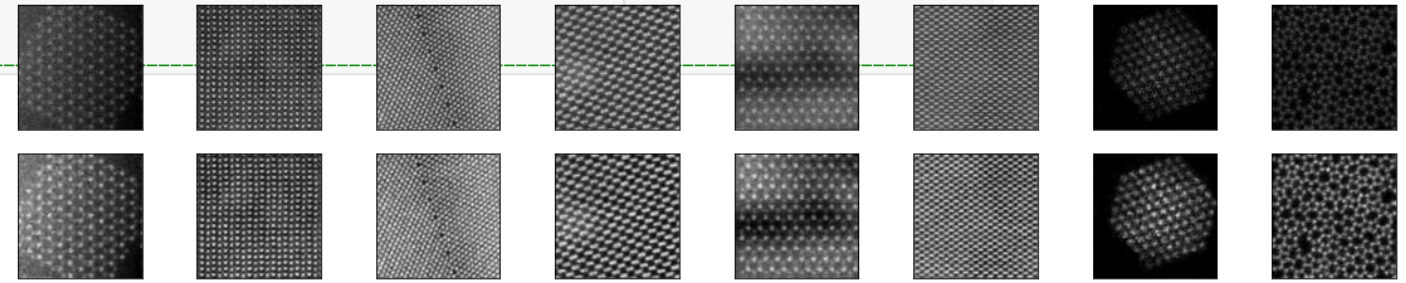
```
#  先不讀取圖片,  真的要訓練才讀
#  只讀取路徑

df_path  =  pd.DataFrame(columns=["path"])
df_solution  =  pd.DataFrame(columns=["solution"])
df_predict  =  pd.DataFrame(columns=["path"])

for  p  in  glob.glob("/content/gdrive/My  Drive/project/image/*.png"):
       s  =  pd.Series([p],  index=["path"])
       df_path  =  df_path.append(s,  ignore_index=True)
for  p  in  glob.glob("/content/gdrive/My  Drive/project/solution/*.png"):
       s  =  pd.Series([p],  index=["solution"])
       df_solution  =  df_solution.append(s,  ignore_index=True)
for  p  in  glob.glob("/content/gdrive/My  Drive/project/test_img/*.png"):
       s  =  pd.Series([p],  index=["path"])
       df_predict  =  df_predict.append(s,  ignore_index=True)

#  將圖片按照照片編號牌好，而不是索引值
df_path  =  df_path.sort_values(by=['path'])
df_solution  =  df_solution.sort_values(by=['solution'])

print(df_path)
print(df_solution)
print(df_predict)
```

```
                                                  path
766  /content/gdrive/My Drive/project/image/00001.png
352  /content/gdrive/My Drive/project/image/00002.png
285  /content/gdrive/My Drive/project/image/00003.png
402  /content/gdrive/My Drive/project/image/00004.png
416  /content/gdrive/My Drive/project/image/00005.png
..                                                 ...
23   /content/gdrive/My Drive/project/image/00996.png
522  /content/gdrive/My Drive/project/image/00997.png
121  /content/gdrive/My Drive/project/image/00998.png
611  /content/gdrive/My Drive/project/image/00999.png
721  /content/gdrive/My Drive/project/image/01000.png

[1000 rows x 1 columns]
                                              solution
301  /content/gdrive/My Drive/project/solution/0000...
769  /content/gdrive/My Drive/project/solution/0000...
950  /content/gdrive/My Drive/project/solution/0000...
734  /content/gdrive/My Drive/project/solution/0000...
165  /content/gdrive/My Drive/project/solution/0000...
..                                                 ...
929  /content/gdrive/My Drive/project/solution/0099...
655  /content/gdrive/My Drive/project/solution/0099...
792  /content/gdrive/My Drive/project/solution/0099...
246  /content/gdrive/My Drive/project/solution/0099...
471  /content/gdrive/My Drive/project/solution/0100...

[1000 rows x 1 columns]
                                                  path
```

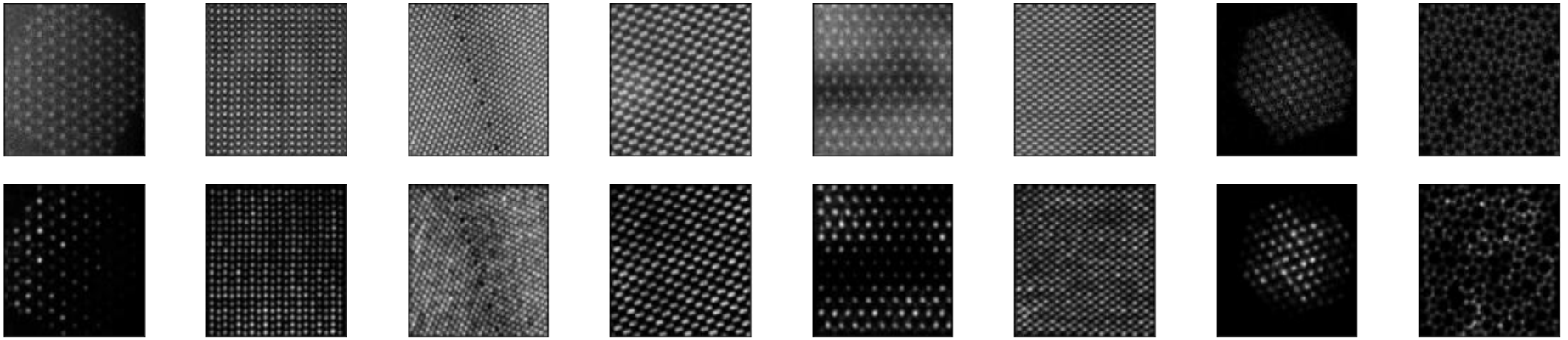
學到的事情

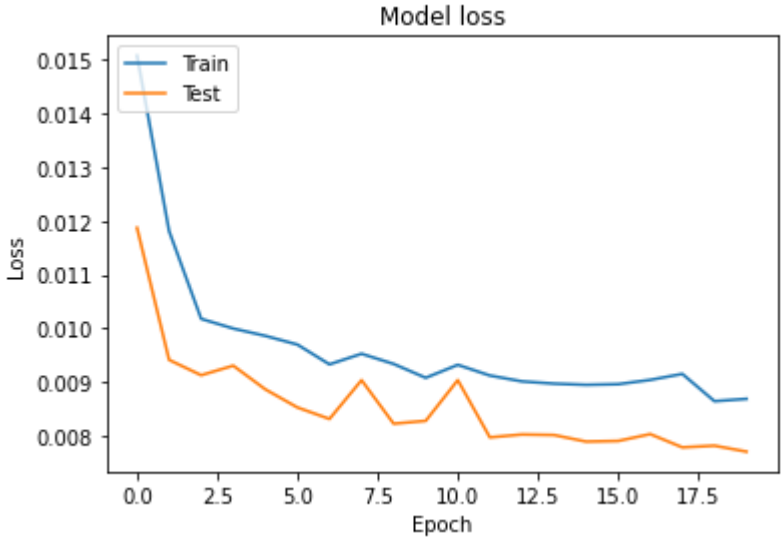
原本處理圖片的方式，但訓練效果有限，還需再改良

```
x_train_list = []
y_train_list = []

for i,j in zip(x_train,y_train):
    x_one_np = np.zeros((pic_size,pic_size,1))# 創建新的np，將shape from (n,n,3) to (n,n,1)
    y_one_np = np.zeros((pic_size,pic_size,1))
    x_img = load_img(i, target_size=(pic_size, pic_size))# 依路徑把照片讀入
    y_img = load_img(j, target_size=(pic_size, pic_size))
    x_img = img_to_array(x_img)# 將照片轉為array
    y_img = img_to_array(y_img)
    for row in range(pic_size):# 將shape from (n,n,3) to (n,n,1)
        for colume in range(pic_size):
            x_one_np[row][colume] = x_img[row][colume][0]
            y_one_np[row][colume] = x_img[row][colume][0]
    x_train_list.append(x_one_np)# (n,n,1)的array存入list
    y_train_list.append(y_one_np)

x_train_array = np.array(x_train_list)# list to np array
y_train_array = np.array(y_train_list)
x_train_array = x_train_array.astype("float32") / 255.0 #標準化
y_train_array = y_train_array.astype("float32") / 255.0
print(x_train_array.shape)
print(y_train_array.shape)

#-----------------------------
```



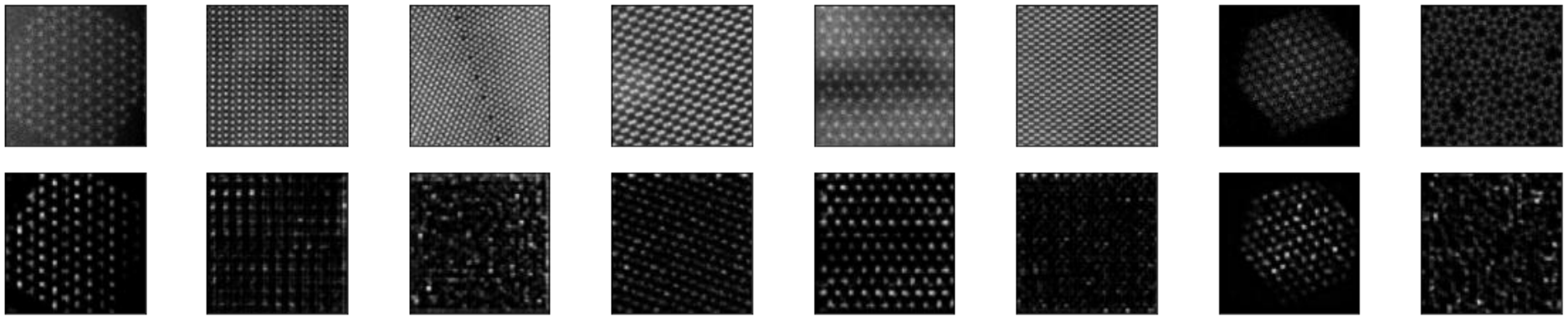
其它數據架構測試

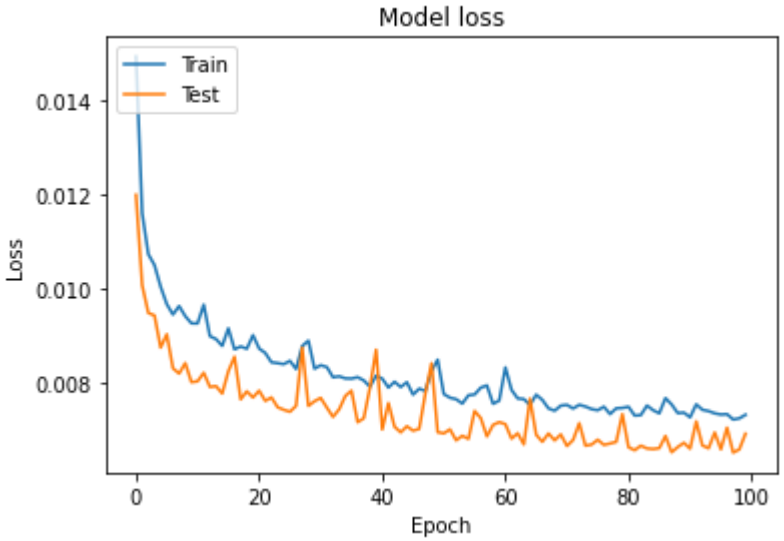




Loss = mse
activation= relu
2層 架構
Filters = [32,32]
Epoch = 20

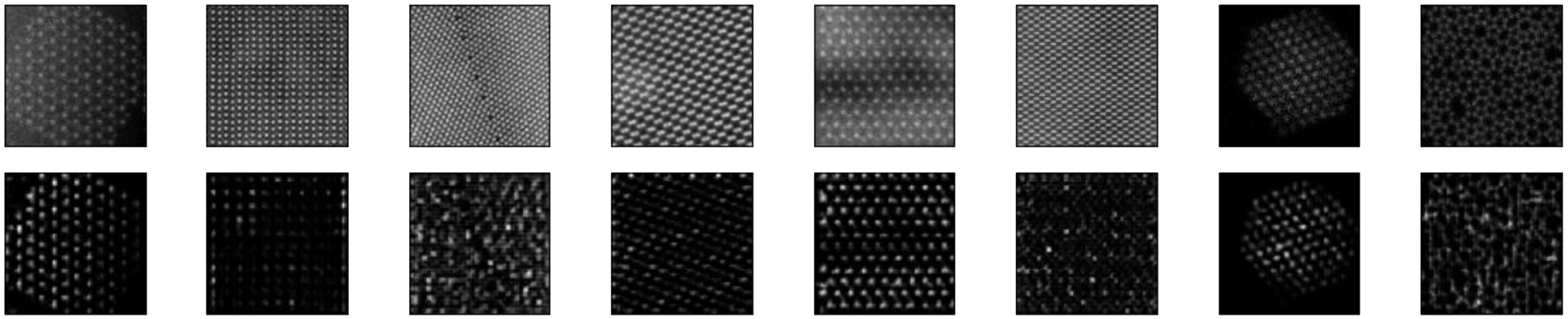
其它數據架構測試

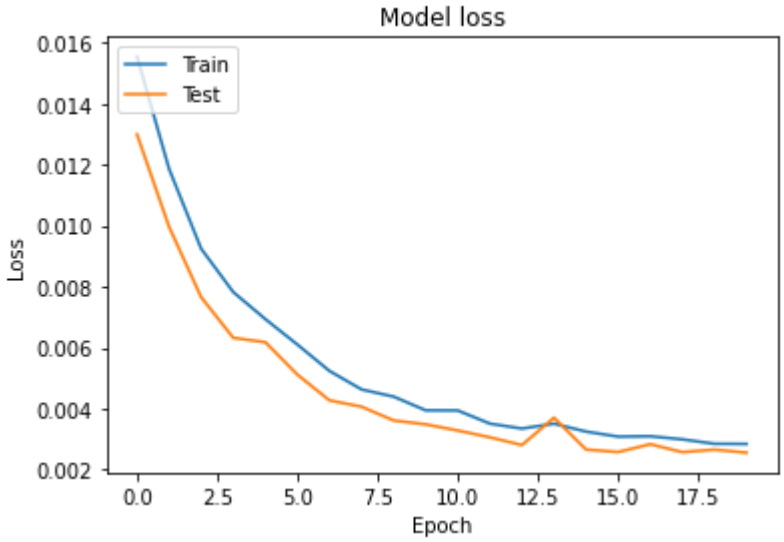




Loss = mse
activation= relu
2層 架構
Filters = [64,32]
Epoch = 100

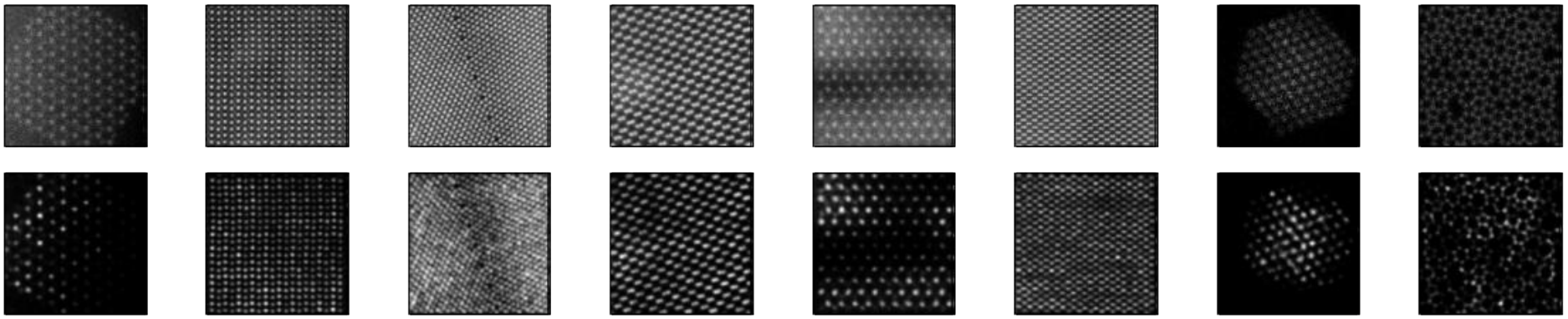
其它數據架構測試

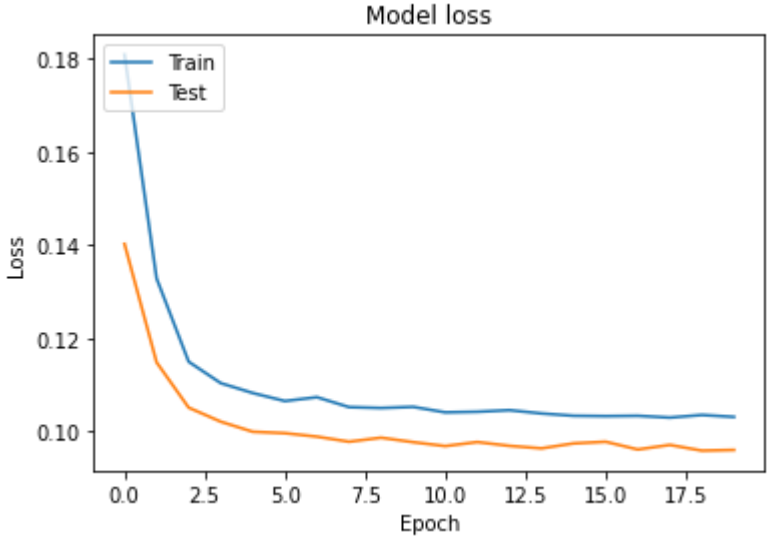




Loss = mse
activation= relu
3層 架構
Filters = [32,32,32]
Epoch = 20

其它數據架構測試





Loss = binary_crossentropy
activation= relu
2層 架構
Filters = [32,32]
Epoch = 20