



明星撞臉 影像辨識

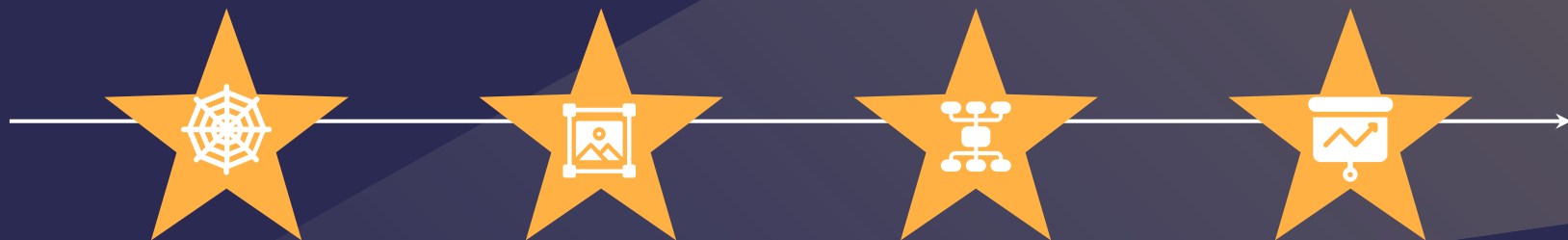
★ 使用CNN ★



宋芸樺、夏于喬是演藝圈有名的「撞臉明星」
藉由訓練CNN模型嘗試能否成功分辨兩人

網路爬蟲收集圖片

建立模型訓練/預測



圖片資料擴增

評估模型



01

爬取圖片

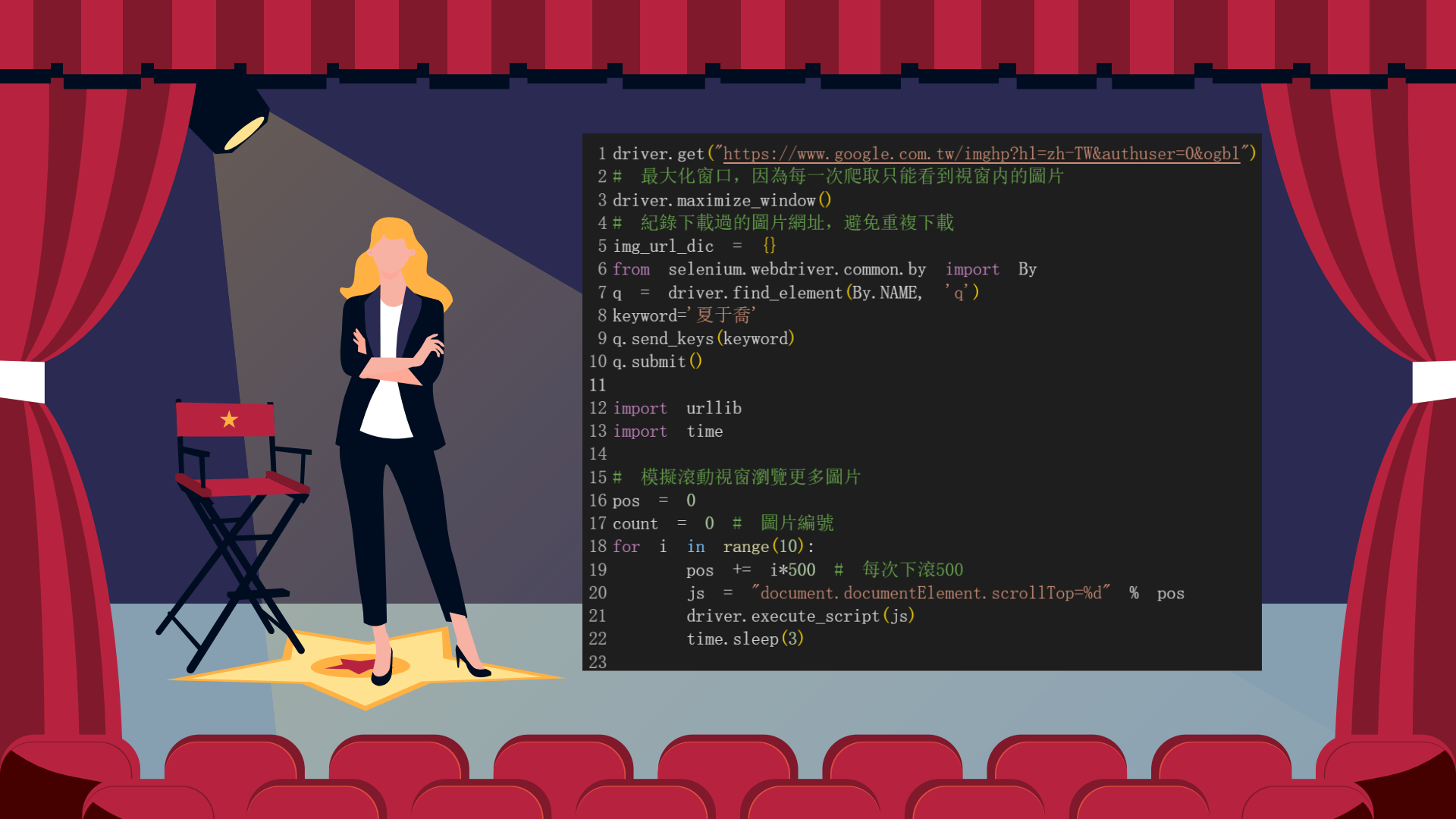
Selenium
Instaloader



Google

圖片





```
1 driver.get("https://www.google.com.tw/imghp?hl=zh-TW&authuser=0&ogbl")
2 # 最大化窗口，因為每一次爬取只能看到視窗內的圖片
3 driver.maximize_window()
4 # 紀錄下載過的圖片網址，避免重複下載
5 img_url_dic = {}
6 from selenium.webdriver.common.by import By
7 q = driver.find_element(By.NAME, 'q')
8 keyword=' 夏于喬'
9 q.send_keys(keyword)
10 q.submit()
11
12 import urllib
13 import time
14
15 # 模擬滾動視窗瀏覽更多圖片
16 pos = 0
17 count = 0 # 圖片編號
18 for i in range(10):
19     pos += i*500 # 每次下滾500
20     js = "document.documentElement.scrollTop=%d" % pos
21     driver.execute_script(js)
22     time.sleep(3)
23
```



instaloader / instaloader

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aandergr Update sponsors in README 5509ea7 · last month 872 Commits

.github	Temporarily disable lint check on python 3.11	4 months ago
deploy	update CI dependencies, require Python>=3.8	last year
docs	update CI dependencies, require Python>=3.8	last year
instaloader	Release of version 4.10.3	last month
test	Improve typing syntax and type NamedTuples (#1610)	2 years ago
.gitignore	travis: use Pipfile for dependency pinning	5 years ago
.pylintrc	update CI dependencies, require Python>=3.8	last year

開源第三方套件Instaloader

An illustration of a hand holding a clapperboard, with a spotlight beam shining on it from the left. The clapperboard has a black top bar with white diagonal stripes and a black bottom bar with white diagonal stripes. The hand is holding the clapperboard from the left side, with the thumb and index finger visible. The background is dark blue with red curtains on the left and right sides.

02

圖片資料擴增

OpenCV

A small, black, stage spotlight on a stand, positioned at the bottom right of the image, casting a beam of light upwards towards the center.

調整圖片大小

水平翻轉

✓ 資料擴增

將檔案中的圖片統一水平翻轉，擴展訓練集樣本

```
[1] 1 import cv2
2 def data_additional(folder_path):
3     image_files = os.listdir(folder_path)
4     # 確定資料夾中只包含圖片檔案
5     image_files = [file for file in image_files if file.endswith('.jpg')]
6     n = 0
7     # 處理每一張圖片，進行水平翻轉並保存到新的位置
8     for file_name in image_files:
9         # 讀取圖片
10        n += 1
11        image_path = os.path.join(folder_path, file_name)
12        image = cv2.imread(image_path)
13
14        # 水平翻轉圖片
15        flipped_image = cv2.flip(image, 1)
16
17        # 生成新的檔案名稱
18        new_file_name = "flipped_" + file_name
19
20        # 指定新檔案的保存路徑
21        save_path = os.path.join(folder_path, new_file_name)
22
23        # 將處理後的圖片保存到新的位置
24        cv2.imwrite(save_path, flipped_image)
25        print(f"水平翻轉並保存第{n}張圖片。")
```



The background is a stylized stage. At the top, there are red curtains. The main background is a dark blue gradient. On the right side, there is a red podium with two microphones. In the foreground, there is a red carpet. On the left side of the carpet, there are yellow stanchions with red ropes. A spotlight is shining from the bottom left towards the center of the stage.

03

模型建立

載入圖檔 圖像歸一化 建立模型

```
1 (train_images, train_labels), (test_images, test_labels) = load_data()
```

```
Loading train
100% |██████████| 808/808 [00:15<00:00, 51.58it/s]
100% |██████████| 802/802 [00:16<00:00, 47.53it/s]
Loading test
100% |██████████| 100/100 [00:01<00:00, 60.94it/s]
100% |██████████| 100/100 [00:01<00:00, 62.49it/s]
```

```
1 #隨機性
2 train_images, train_labels = shuffle(train_images, train_labels, random_state=25)
3 #標準化
4 train_images = train_images / 255.0
5 test_images = test_images / 255.0
```

```
1 input_shape = (150, 150, 3)
2
3 model = Sequential([
4     Conv2D(50, (3, 3), input_shape=input_shape, padding='same',
5         activation='relu', strides=2),
6     MaxPooling2D(pool_size=(2, 2), strides=2),
7     Dropout(0.2),
8     Conv2D(75, (3, 3), input_shape=input_shape, padding='same',
9         activation='relu', strides=2),
10    MaxPooling2D(pool_size=(2, 2), strides=2),
11    Dropout(0.2),
12    Flatten(),
13    Dropout(0.5),
14    Dense(2, activation='softmax') #輸出層, 分類用softmax
15 ])
```

編譯模型

EarlyStopping

載入模型訓練

```
1 model.compile(optimizer = 'adam',  
2               loss = 'sparse_categorical_crossentropy',  
3               metrics=['accuracy'])
```

```
1 from keras.callbacks import EarlyStopping  
2  
3 # 建立早停回調函數  
4 early_stopping = EarlyStopping(monitor='val_accuracy', patience=5, restore_best_weights=True)
```

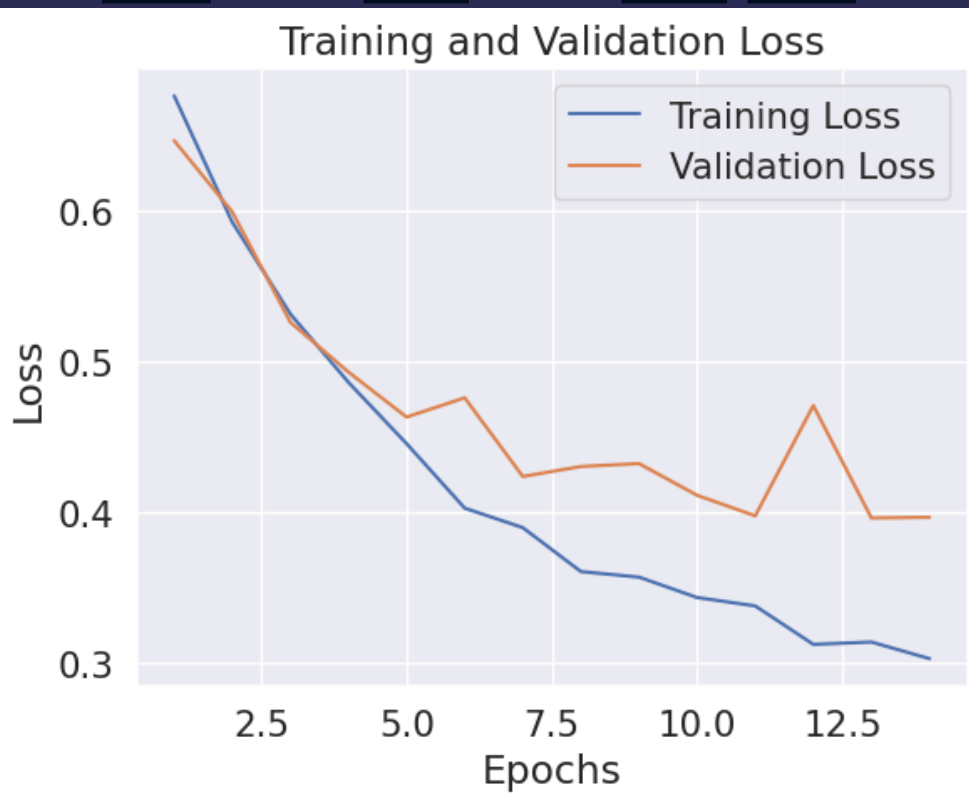
```
1 history = model.fit(train_images, train_labels,  
2                    batch_size=80, epochs=100,  
3                    validation_split=0.1, verbose=1, callbacks=[early_stopping])
```

Loss: 0.3027

Accuracy: 0.8737

Val loss: 0.3965

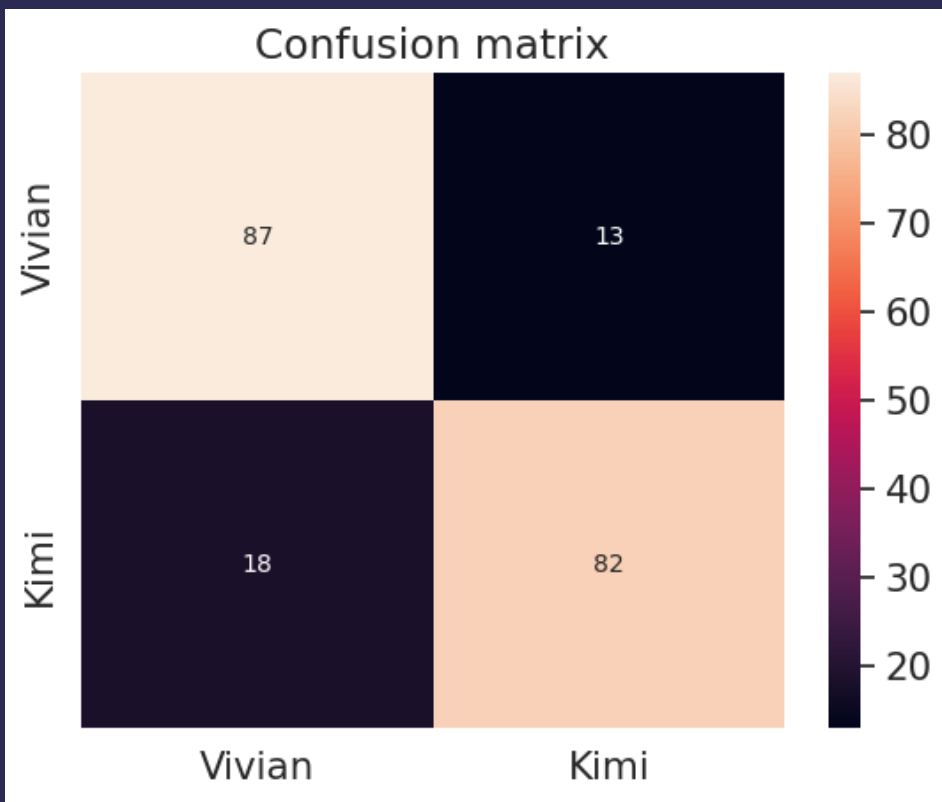
Val accuracy: 0.8509

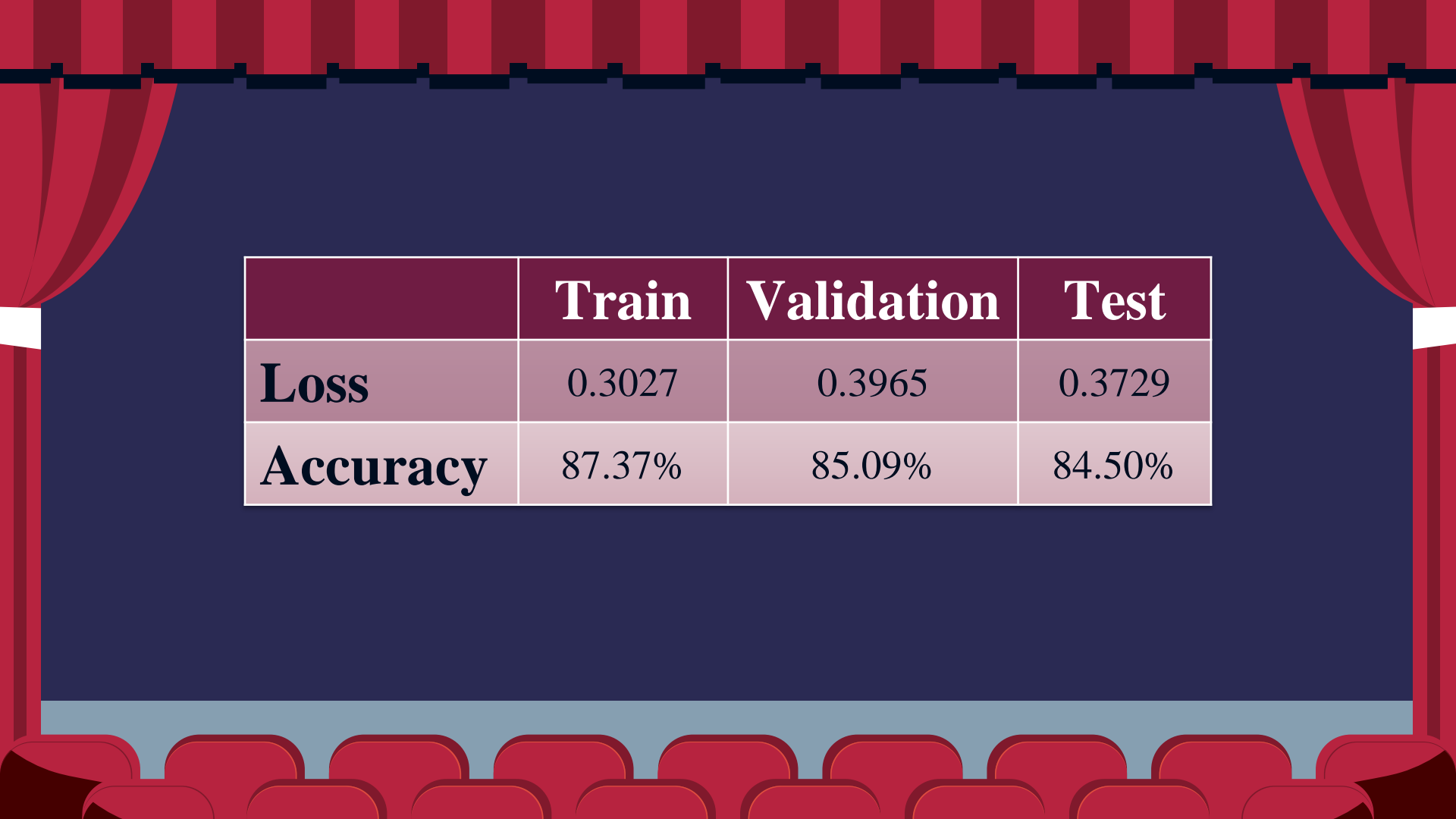


模型預測測試集

Loss: 0.3729

Accuracy: 0.8450





	Train	Validation	Test
Loss	0.3027	0.3965	0.3729
Accuracy	87.37%	85.09%	84.50%

結論

訓練集和測試集損失函數跟精準度相差不大
沒有明顯的過擬合

增加資料集可能對提升模型準確度較有幫助



**Thank You
For Watching!**