Final Presentation

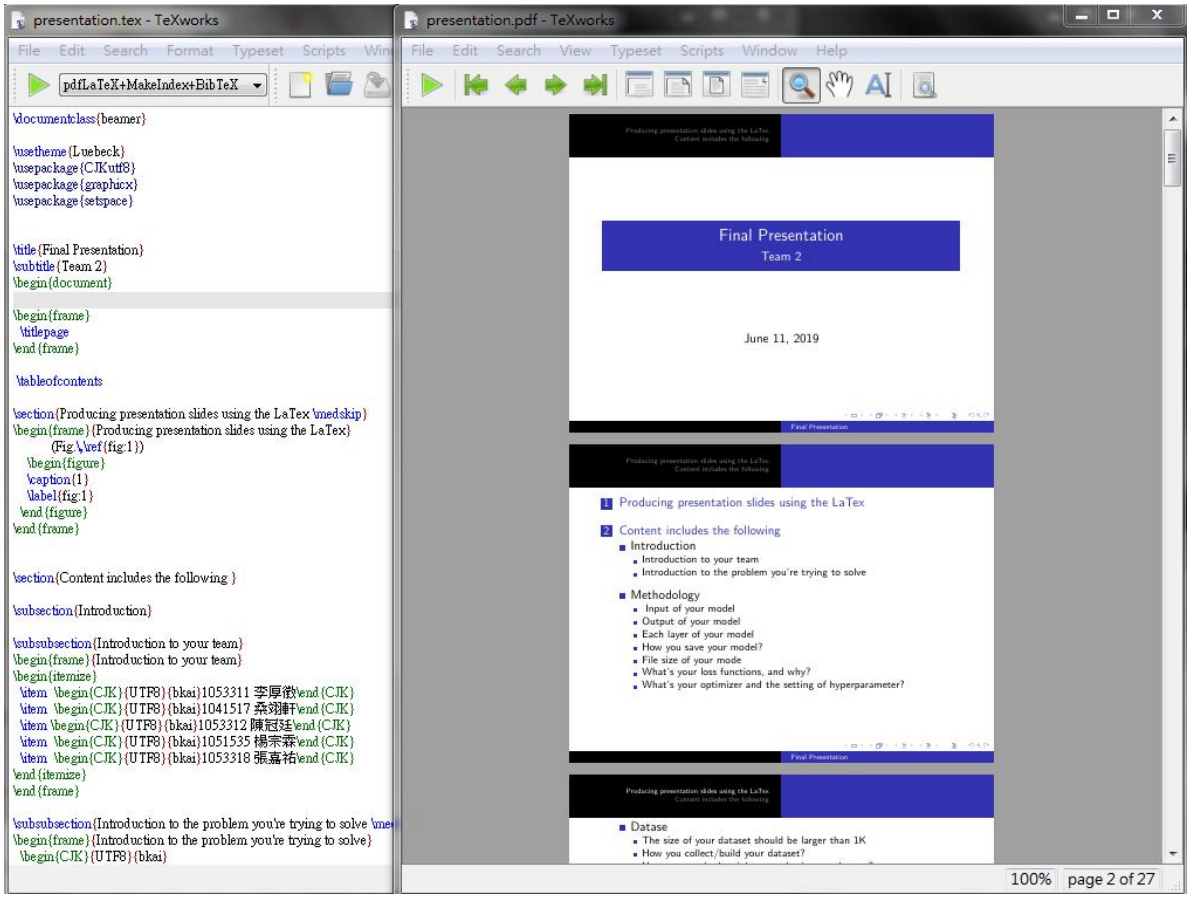
Team 2

June 11, 2019

- Dataset
  - The size of your dataset should be larger than 1K
  - How you collect/build your dataset?
  - How many paired training samples in your dataset?
  - How many paired validating samples in your dataset?
  - How many paired testing samples in your dataset?
- Experimental Evaluation
  - Experimental environment (CPU, GPU, memory,. . . ,etc.)
  - How many epochs you set for training?
  - Qualitative evaluation
  - Quantitative evaluation
- Live demo of your work

Producing presentation slides using the LaTex

(Fig. 1)



Introduction

Introduction

Our team members

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The problem we're trying to solve

期末專題主要是想解決我們對大自然的好奇心，當我們在校園探索當中，有很多花我們不知道其名稱，透過這門課所學的知識，利用影像辨識的方法，將各種花朵辨識出來。

Methodology

Model

input of our model (Fig. 2)

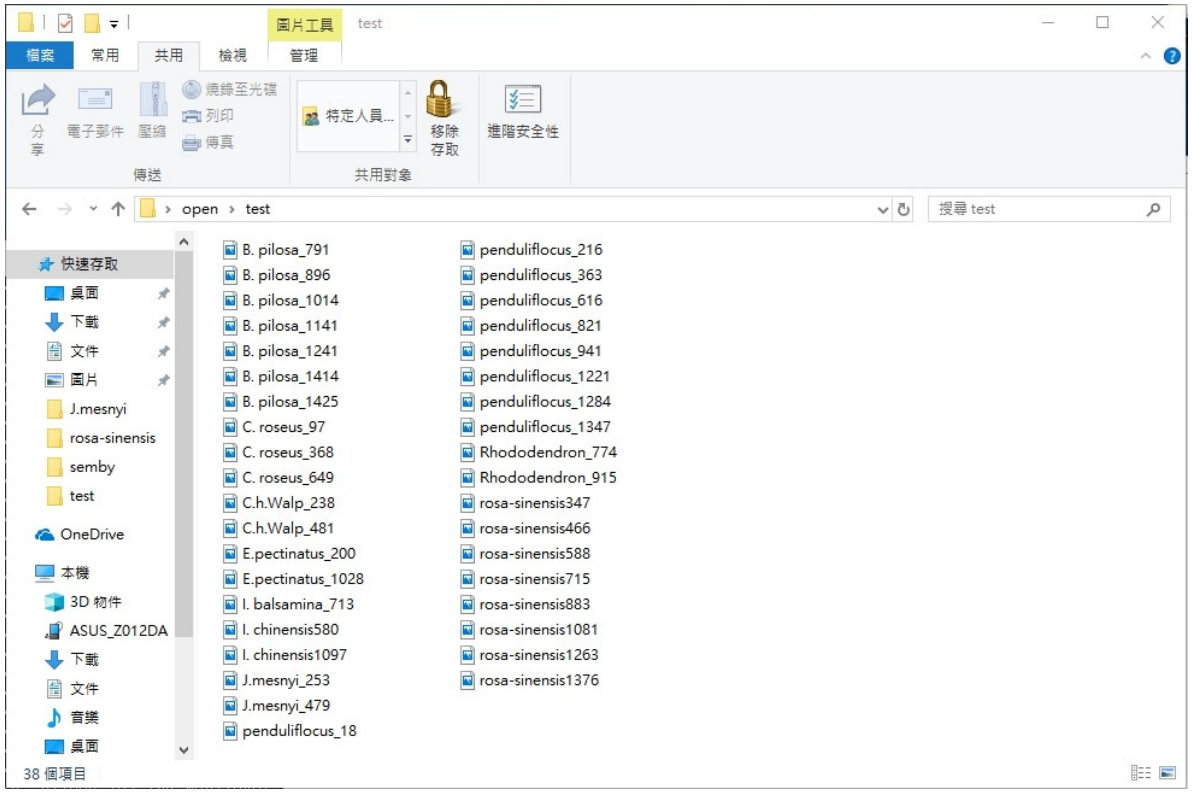


Figure: 2

Model(cont.)

output of our model , prediction result(包含: 預測的label, 其信心度)(Fig. 3)

```
>>> test/I. chinensis160.jpg
test/I. chinensis160.jpg i chinensis 0.9980248
>>> test/I. chinensis4.jpg
test/I. chinensis4.jpg i chinensis 0.9948152
>>> test/I. chinensis580.jpg
test/I. chinensis580.jpg i chinensis 0.9995357
>>> test/I. chinensis806.jpg
test/I. chinensis806.jpg i chinensis 0.9998437
>>> test/J.mesnyi_1028.jpg
test/J.mesnyi_1028.jpg j mesnyi 0.9997085
>>> test/J.mesnyi_253.jpg
test/J.mesnyi_253.jpg j mesnyi 0.9999585
>>> test/J.mesnyi_479.jpg
test/J.mesnyi_479.jpg j mesnyi 0.99997115
>>> test/J.mesnyi_634.jpg
test/J.mesnyi_634.jpg j mesnyi 0.9999558
>>> test/J.mesnyi_768.jpg
test/J.mesnyi_768.jpg j mesnyi 0.9999
>>> test/penduliflocus_1221.jpg
test/penduliflocus_1221.jpg penduliflocus 0.9997986
>>> test/penduliflocus_216.jpg
test/penduliflocus_216.jpg penduliflocus 0.9946497
>>> test/penduliflocus_363.jpg
test/penduliflocus_363.jpg penduliflocus 0.9999683
>>> test/penduliflocus_616.jpg
test/penduliflocus_616.jpg penduliflocus 0.99387544
>>> test/penduliflocus_821.jpg
test/penduliflocus_821.jpg penduliflocus 0.9999893
```

Figure 3

Model(cont.)

(Fig. 4)

```
>>> test/Rhododendron_110.jpg
test/Rhododendron_110.jpg rhododendron 0.9997427
>>> test/Rhododendron_277.jpg
test/Rhododendron_277.jpg rhododendron 0.9990305
>>> test/Rhododendron_531.jpg
test/Rhododendron_531.jpg rhododendron 0.99960035
>>> test/Rhododendron_774.jpg
test/Rhododendron_774.jpg rhododendron 0.9990835
>>> test/Rhododendron_915.jpg
test/Rhododendron_915.jpg rhododendron 0.99908745
>>> test/rosa-sinensis118.jpg
test/rosa-sinensis118.jpg rosa sinensis 0.9999633
>>> test/rosa-sinensis378.jpg
test/rosa-sinensis378.jpg rosa sinensis 0.99791247
>>> test/rosa-sinensis506.jpg
test/rosa-sinensis506.jpg rosa sinensis 0.9999703
>>> test/rosa-sinensis695.jpg
test/rosa-sinensis695.jpg rosa sinensis 0.9995598
>>> test/rosa-sinensis954.jpg
test/rosa-sinensis954.jpg rosa sinensis 0.98469156
```

Model(cont.)

我們的model層級分成: Expansion layer, convolution layer, projection layer... (Fig. 5)

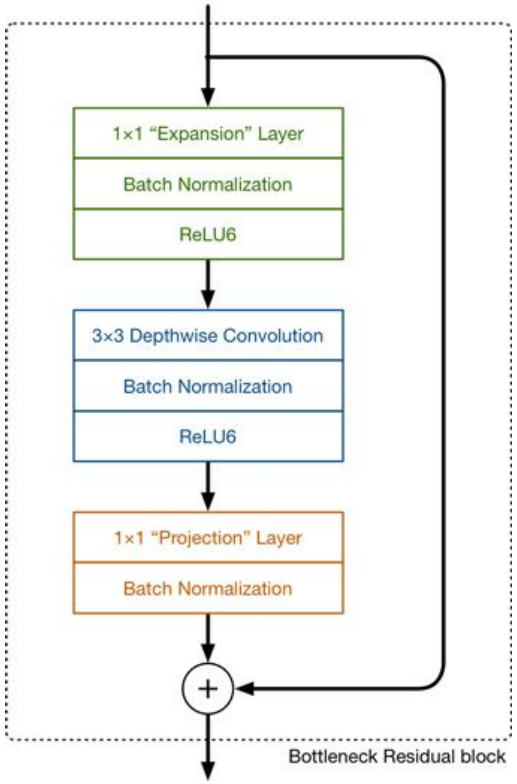
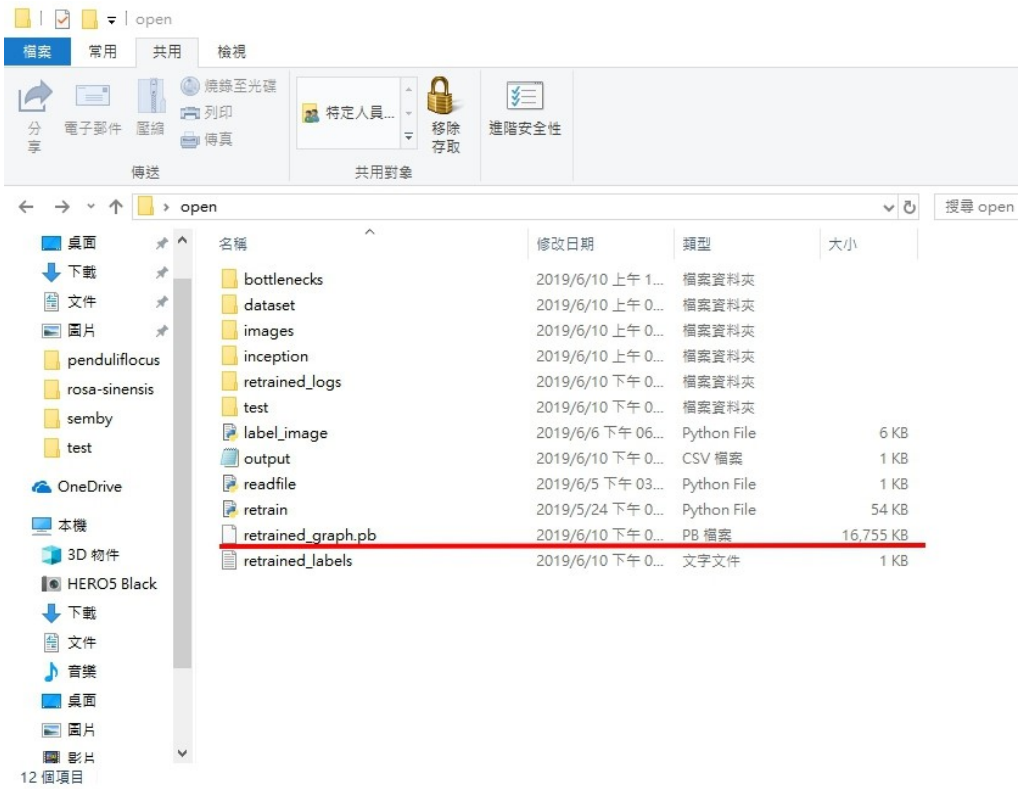


Figure: 5

Model(cont.)

We save as filename.pb(pb檔)

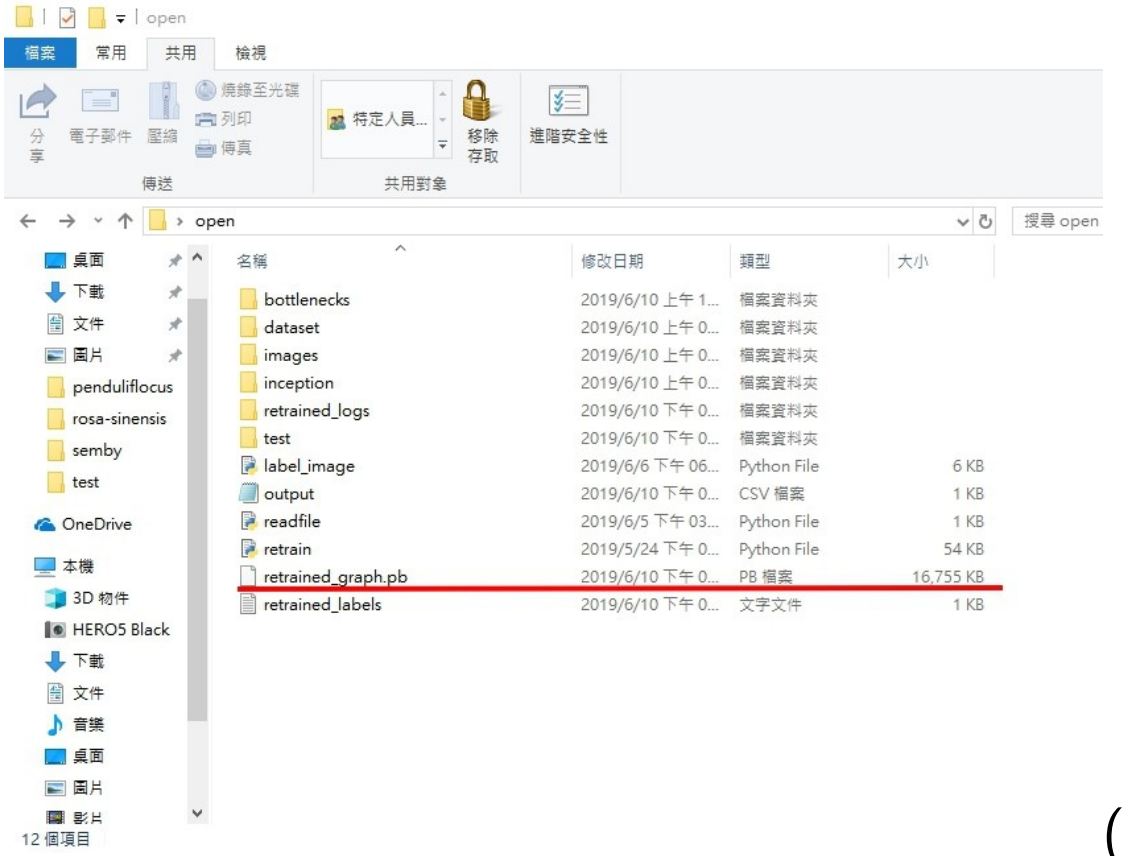


(Fig. 6)

Figure: 6

Model(cont.)

model大小16755KB



(Fig. 7)

Figure: 7

Loss function

Cross-entropy:
在分類的狀況下，通常希望錯誤率越小越好，所以用錯誤率當損失函數是一個選項，但實際上我們並不會直接拿分類錯誤率當作損失函數進行最佳化， 用錯誤率得到只知道此筆資料判別錯誤，但模型不會知道現在的模型錯的很多還是很少， 這樣模型在學習時根本不知道最佳的模型在那的方向，也不知道要更新多少。

Cross-entropy 是 所有類別的entropy的總和，簡單來說， 就是各類別的訊息量的平均量(entropy)的總和。entropy也可以解釋成資料的不確定性， 所以越低代表資料越穩定也就是說model越好。

Dataset

Dataset

Dataset

The size of our dataset 大小4.85GB 共有11098個檔案 (Fig. 8)

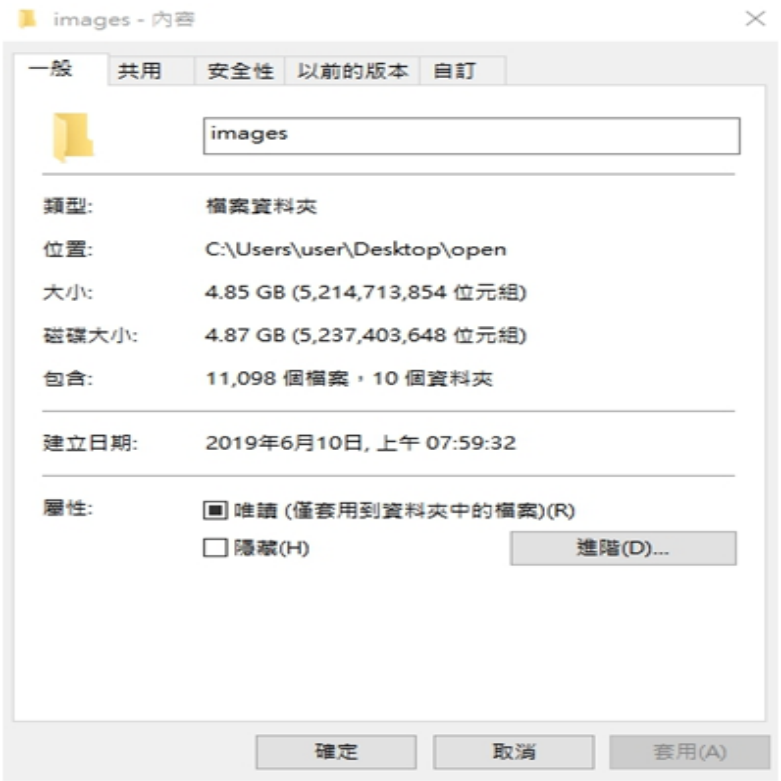


Figure: 8

Dataset(cont.)

dataset 檔案 (Fig. 9)

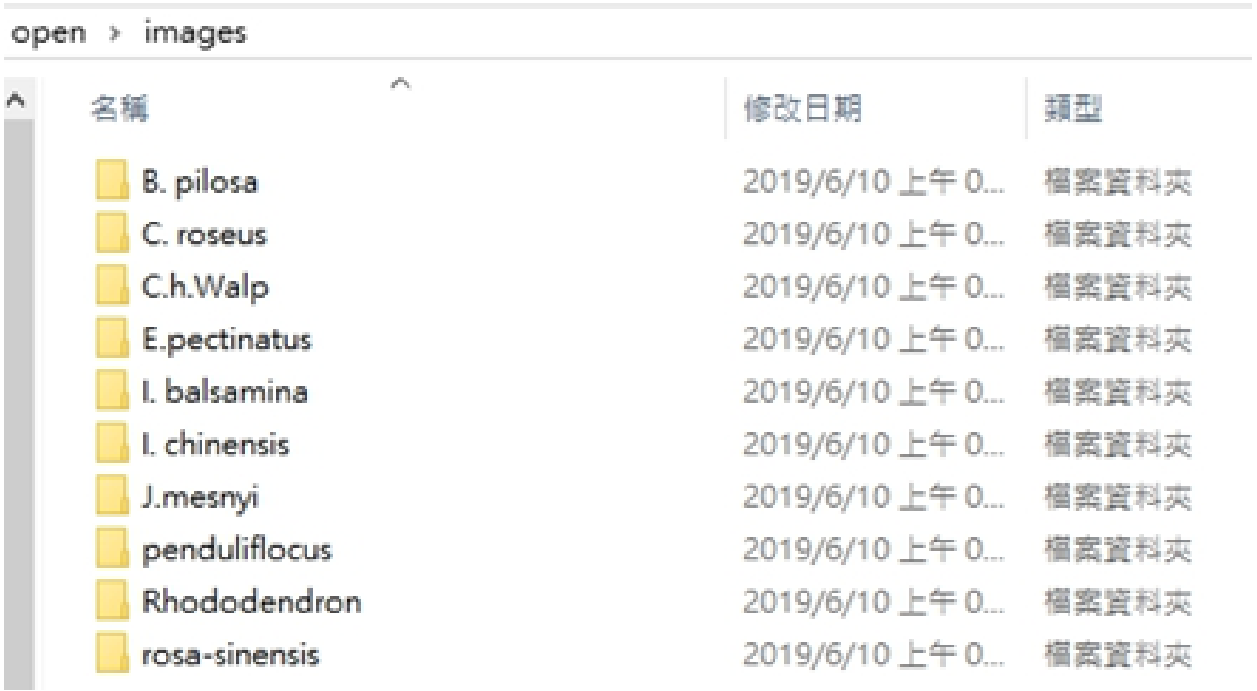


Figure: 9

Dataset(cont.)

dataset的收集方法我們是對花做360度的影片拍攝，再將影片以frame切割得到圖片。

training、validating以及testing的配對樣本數比例是:
training:validating:testing = 8:1:1

Experimental Evaluation

Experimental Evaluation

我們是在CPU的環境下進行實作及試驗

設定4000 ephocs 來進行訓練

Qualitative

共10種花，對每種花各做五次測試的結果 共50個測資皆正確。(Fig. 10)

```
test/B. pilosa_1141.jpg b pilosa 0.9965431
>>> test/B. pilosa_1425.jpg
test/B. pilosa_1425.jpg b pilosa 0.9996896
>>> test/B. pilosa_559.jpg
test/B. pilosa_559.jpg b pilosa 0.9986951
>>> test/B. pilosa_6.jpg
test/B. pilosa_6.jpg b pilosa 0.9999217
>>> test/B. pilosa_896.jpg
test/B. pilosa_896.jpg b pilosa 0.99718636
>>> test/C. roseus_1002.jpg
test/C. roseus_1002.jpg c roseus 0.9949675
>>> test/C. roseus_368.jpg
test/C. roseus_368.jpg c roseus 0.99927694
>>> test/C. roseus_649.jpg
test/C. roseus_649.jpg c roseus 0.99999595
>>> test/C. roseus_813.jpg
test/C. roseus_813.jpg c roseus 0.9992322
>>> test/C. roseus_97.jpg
test/C. roseus_97.jpg c roseus 0.99943894
>>> test/C.h.Walp_238.jpg
test/C.h.Walp_238.jpg c h walp 0.9970227
>>> test/C.h.Walp_481.jpg
test/C.h.Walp_481.jpg c h walp 0.99925405
>>> test/C.h.Walp_6.jpg
test/C.h.Walp_6.jpg c h walp 0.99924684
>>> test/C.h.Walp_617.jpg
test/C.h.Walp_617.jpg c h walp 0.9999646
>>> test/C.h.Walp_939.jpg
```

Figure: 10

Qualitative(cont.)

(Fig. 11)

```
test/C.h.Walp_939.jpg c h walp 0.9948272
>>> test/E.pectinatus_1028.jpg
test/E.pectinatus_1028.jpg e pectinatus 0.99966896
>>> test/E.pectinatus_200.jpg
test/E.pectinatus_200.jpg e pectinatus 0.99846506
>>> test/E.pectinatus_406.jpg
test/E.pectinatus_406.jpg e pectinatus 0.9999678
>>> test/E.pectinatus_617.jpg
test/E.pectinatus_617.jpg e pectinatus 0.99992275
>>> test/E.pectinatus_875.jpg
test/E.pectinatus_875.jpg e pectinatus 0.99941254
>>> test/I. balsamina_321.jpg
test/I. balsamina_321.jpg i balsamina 0.99966896
>>> test/I. balsamina_4.jpg
test/I. balsamina_4.jpg i balsamina 0.9973773
>>> test/I. balsamina_483.jpg
test/I. balsamina_483.jpg i balsamina 0.9999312
>>> test/I. balsamina_713.jpg
test/I. balsamina_713.jpg i balsamina 0.9996537
>>> test/I. balsamina_729.jpg
test/I. balsamina_729.jpg i balsamina 0.99821055
>>> test/I. chinensis1097.jpg
test/I. chinensis1097.jpg i chinensis 0.9984549
>>> test/I. chinensis160.jpg
```

Figure: 11

Qualitative(cont.)

(Fig. 12)

```
>>> test/I. chinensis160.jpg
test/I. chinensis160.jpg i chinensis 0.9980248
>>> test/I. chinensis4.jpg
test/I. chinensis4.jpg i chinensis 0.9948152
>>> test/I. chinensis580.jpg
test/I. chinensis580.jpg i chinensis 0.9995357
>>> test/I. chinensis806.jpg
test/I. chinensis806.jpg i chinensis 0.9998437
>>> test/J.mesnyi_1028.jpg
test/J.mesnyi_1028.jpg j mesnyi 0.9997085
>>> test/J.mesnyi_253.jpg
test/J.mesnyi_253.jpg j mesnyi 0.9999585
>>> test/J.mesnyi_479.jpg
test/J.mesnyi_479.jpg j mesnyi 0.99997115
>>> test/J.mesnyi_634.jpg
test/J.mesnyi_634.jpg j mesnyi 0.9999558
>>> test/J.mesnyi_768.jpg
test/J.mesnyi_768.jpg j mesnyi 0.9999
>>> test/penduliflocus_1221.jpg
test/penduliflocus_1221.jpg penduliflocus 0.9997986
>>> test/penduliflocus_216.jpg
test/penduliflocus_216.jpg penduliflocus 0.9946497
>>> test/penduliflocus_363.jpg
test/penduliflocus_363.jpg penduliflocus 0.9999683
>>> test/penduliflocus_616.jpg
test/penduliflocus_616.jpg penduliflocus 0.99387544
>>> test/penduliflocus_821.jpg
```

Figure: 12

Qualitative(cont.)

(Fig. 13)

```
test/penduliflocus_821.jpg penduliflocus 0.9999893
>>> test/Rhododendron_110.jpg
test/Rhododendron_110.jpg rhododendron 0.9997427
>>> test/Rhododendron_277.jpg
test/Rhododendron_277.jpg rhododendron 0.9990305
>>> test/Rhododendron_531.jpg
test/Rhododendron_531.jpg rhododendron 0.99960035
>>> test/Rhododendron_774.jpg
test/Rhododendron_774.jpg rhododendron 0.9990835
>>> test/Rhododendron_915.jpg
test/Rhododendron_915.jpg rhododendron 0.99908745
>>> test/rosa-sinensis118.jpg
test/rosa-sinensis118.jpg rosa sinensis 0.9999633
>>> test/rosa-sinensis378.jpg
test/rosa-sinensis378.jpg rosa sinensis 0.99791247
>>> test/rosa-sinensis506.jpg
test/rosa-sinensis506.jpg rosa sinensis 0.9999703
>>> test/rosa-sinensis695.jpg
test/rosa-sinensis695.jpg rosa sinensis 0.9995598
>>> test/rosa-sinensis954.jpg
test/rosa-sinensis954.jpg rosa sinensis 0.98469156
```

Figure: 13

Quantitative

(Fig. 14) 以下是實作的結果值

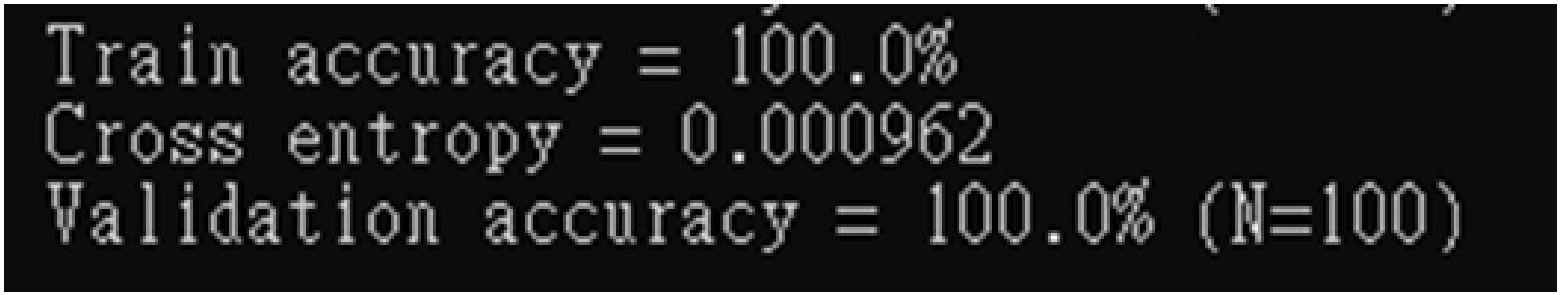


Figure: 14

End