

iWildCam 2019 - FGVC6

Categorize animals in the wild

F. 黃騰陞¹ S. 吳宗晉² T. 施紹唐³

¹Department of Computer Science
University of Yuan Ze

開放平台軟體期末專題, 2019

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset
- 4 Experimental Evaluation

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset
- 4 Experimental Evaluation

Introduction

成員介紹

- 1043362 黃騰陞
- 1041562 吳宗晉
- 1043310 施紹唐

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset
- 4 Experimental Evaluation

Introduction

專題問題描述

- 我們挑選的主題是Categorize animals in the wild，一個在kaggle上面舉辦的比賽，利用kaggle提供的資料集來訓練出一個模型，讓我們可以藉由這個模型來為輸入影像分類，模型可以區分22種動物，希望可以藉由訓練出模型來監測觀察不同地區生物生態以及遷移情況，讓研究人員可以更輕易的掌握生態變遷。

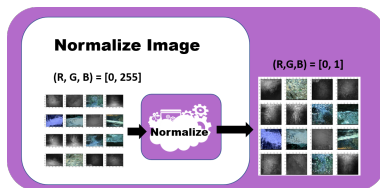
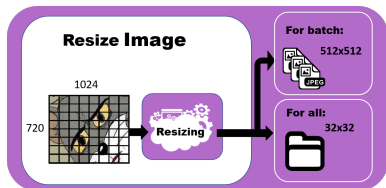
Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset
- 4 Experimental Evaluation

Methodology

Input of model

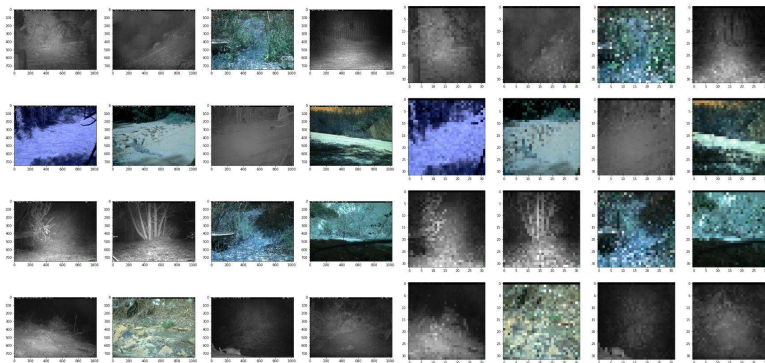
- 一個(32,32,3)圖片



Methodology

Input of model

- 一個(32,32,3)圖片



Outline

1 Introduction

2 Methodology

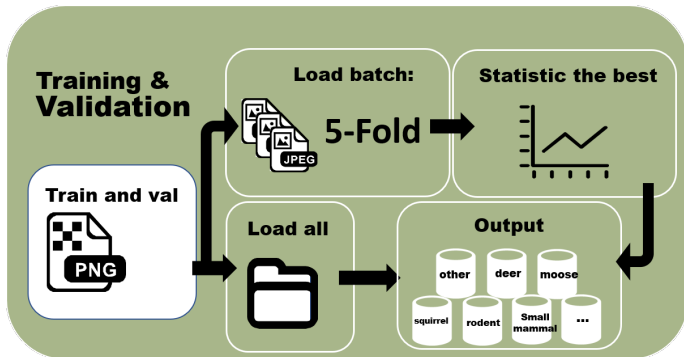
3 Dataset

4 Experimental Evaluation

Methodology

Output of model

- 輸出一個權重檔案，model.h5



Outline

1 Introduction

2 Methodology

3 Dataset

4 Experimental Evaluation

Methodology

Layers of model

- Dense121

GlobalAveragePooling2D(池化層)

激活函數(將輸出轉為機率)

```
-----  
Layer (type)                 Output Shape              Param #  
-----  
densenet121 (Model)          (None, 1, 1, 1024)       7037504  
-----  
global_average_pooling2d_1 ( (None, 1024)       0  
-----  
dense_1 (Dense)              (None, 14)               14350  
-----  
Total params: 7,051,854  
Trainable params: 6,968,206  
Non-trainable params: 83,648  
-----
```

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset
- 4 Experimental Evaluation

- 使用ModelCheckpoint函式儲存框架以及權重

Outline

- 1 Introduction
- 2 Methodology**
- 3 Dataset
- 4 Experimental Evaluation

Methodology

File size of model

```
-----  
Layer (type)                Output Shape                Param #  
-----  
densenet121 (Model)         (None, 1, 1, 1024)         7037504  
-----  
global_average_pooling2d_1 ( (None, 1024)         0  
-----  
dense_1 (Dense)              (None, 14)                  14350  
-----  
Total params: 7,051,854  
Trainable params: 6,968,206  
Non-trainable params: 83,648  
-----
```

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset
- 4 Experimental Evaluation

- 使用categorical crossentropy loss function
因為我們在最後一層使用softmax激活函數計算機率，通常會搭配categorical crossentropy loss function 使用

Outline

1 Introduction

2 Methodology

3 Dataset

4 Experimental Evaluation

Methodology

Optimizer and hyperparameter

- Optimizer使用adam
沒有使用hyperparameter

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset**
- 4 Experimental Evaluation

● kaggle 競賽提供的資料集43G

Data (43 GB)

API [kaggle competitions download -c iwildcam-2019-fgvc6](#) [Download All](#)

Data Sources	About this file	Columns
<ul style="list-style-type: none">sample_submission.csv 154k x 2test.csv 154k x 10train.csv 196k x 11test_images.zip<ul style="list-style-type: none">0081cb4f-2c16-11e9-bcad-06f1...0116a797-2c0c-11e9-bcad-06f1...01518e45-2c05-11e9-bcad-06f1...01b5caa4-2c16-11e9-bcad-06f1...01e9db66-2c03-11e9-bcad-06f1...01f6fa10-2bfb-11e9-bcad-06f10...01f951f6-2c0f-11e9-bcad-06f10...023a40ec-2c0c-11e9-bcad-06f1...023a40fd-2c0c-11e9-bcad-06f1...02977df1-2c15-11e9-bcad-06f1...1000+ moretrain_images.zip	No description yet	<ul style="list-style-type: none">IdPredicted

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset**
- 4 Experimental Evaluation

- kaggle 競賽提供

Data (43 GB) [API](#) [kaggle competitions download -c iwildcam-2019-fgvc6](#) [Download All](#) [?](#)

Data Sources	About this file	Columns
<ul style="list-style-type: none">sample_submission.csv 154k x 2test.csv 154k x 10train.csv 196k x 11test_images.zip<ul style="list-style-type: none">0081cb4f-2c16-11e9-bcad-06f1...0116a797-2c0c-11e9-bcad-06f1...01518e45-2c05-11e9-bcad-06f1...01b5caa4-2c16-11e9-bcad-06f1...01e9db66-2c03-11e9-bcad-06f1...01f6fa10-2bfb-11e9-bcad-06f10...01f951f6-2c0f-11e9-bcad-06f10...023a40ec-2c0c-11e9-bcad-06f1...023a40fd-2c0c-11e9-bcad-06f1...02977df1-2c15-11e9-bcad-06f1...1000+ moretrain_images.zip	No description yet	<ul style="list-style-type: none">IdPredicted

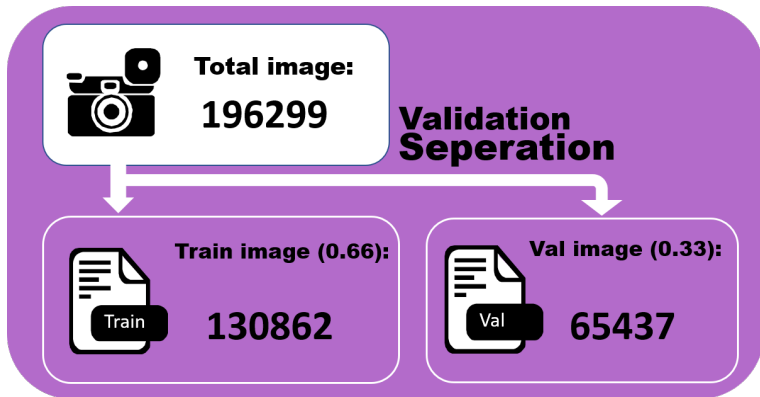
Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset**
- 4 Experimental Evaluation

Methodology

訓練樣本數量

- 130862張圖片



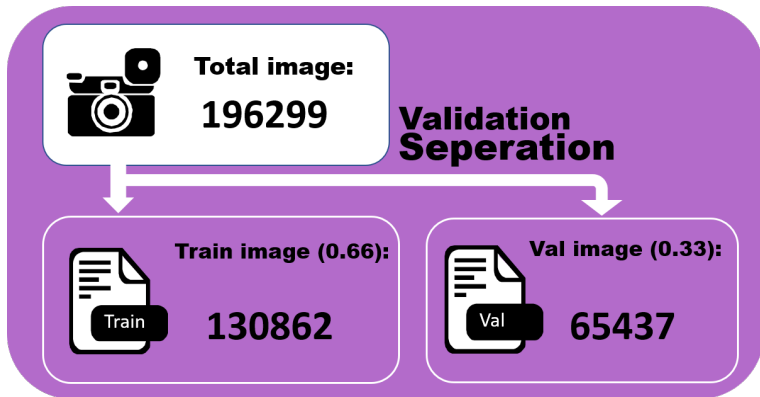
Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset**
- 4 Experimental Evaluation

Dataset

驗證樣本數量

- 65437張圖片



Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset**
- 4 Experimental Evaluation

Dataset

測試樣本數量

- 153730張圖片

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset
- 4 Experimental Evaluation**

Experimental Evaluation

Experimental environment

- kaggle 競賽提供的kernel

Sessions

Draft Session | 0m/9h | GPU On 

CPU 0.06%

RAM 247.9MB/13GB

Disk 266.3MB/4.9GB

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset
- 4 Experimental Evaluation**

Experimental Evaluation

Epochs of training

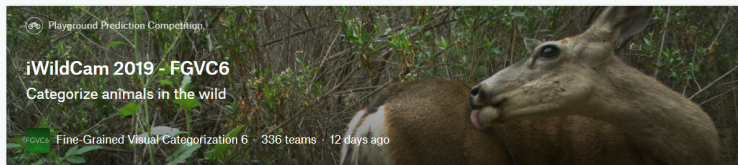
- 35個epochs

Outline

- 1 Introduction
- 2 Methodology
- 3 Dataset
- 4 Experimental Evaluation**

Experimental Evaluation

Qualitative evaluationQualitative evaluation



Playground Prediction Competition

iWildCam 2019 - FGVC6

Categorize animals in the wild

FGVC6 Fine-Grained Visual Categorization 6 · 336 teams · 12 days ago

Overview Data Kernels Discussion Leaderboard Rules Team My Submissions **Late Submission**

Your most recent submission

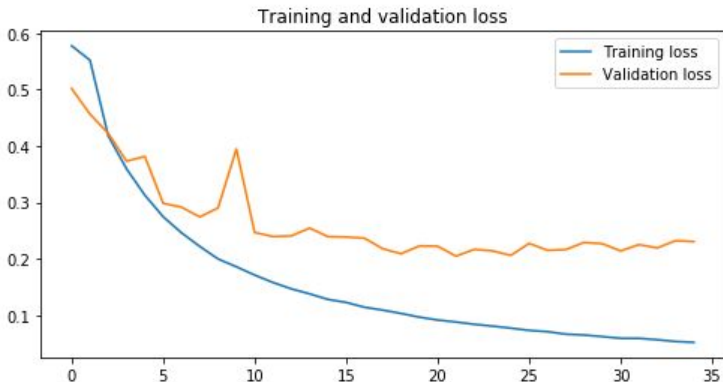
Name	Submitted	Wait time	Execution time	Score
submission.csv	7 days ago	0 seconds	2 seconds	0.125

Complete

[Jump to your position on the leaderboard.](#)

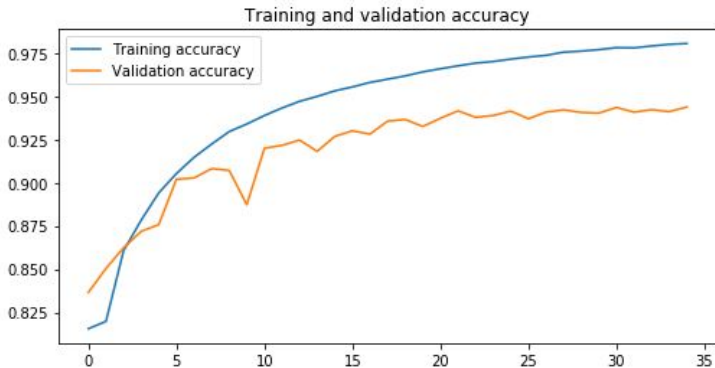
Experimental Evaluation

Qualitative evaluationQualitative evaluation



Experimental Evaluation

Qualitative evaluationQualitative evaluation



組員貢獻表

- 組員貢獻

1043362	黃騰陞	0.4
1041562	吳宗晉	0.3
1043310	施紹唐	0.3