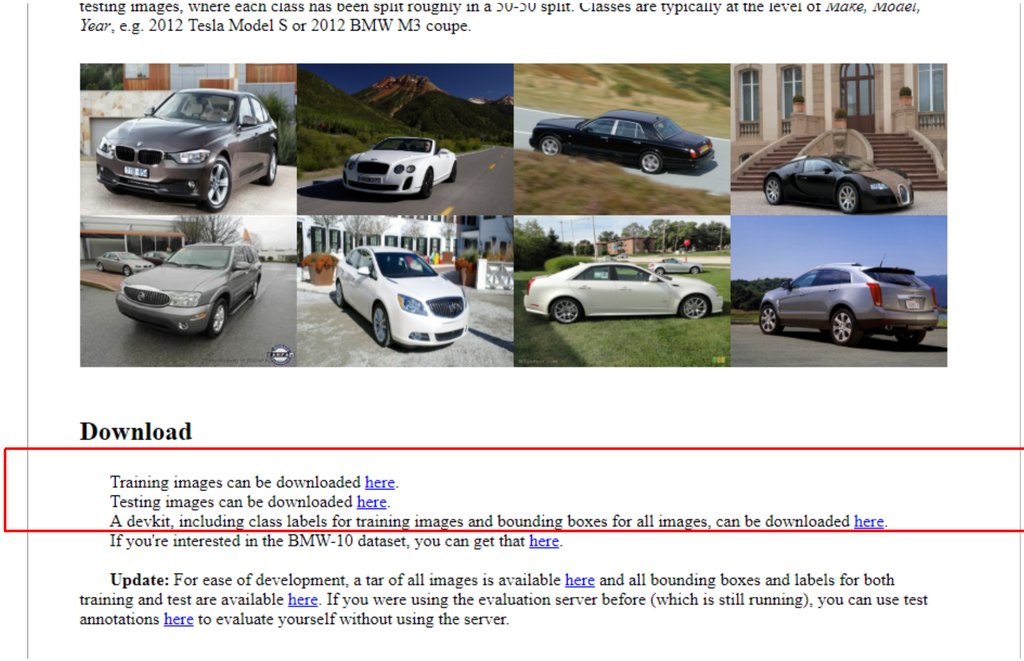
Stanford Car Classification

Dataset Details

- Goal
  - Car type classification
- Task
  - Image classification (196 classes of cars)
- Training / Testing
  - 8,144 / 8,041
- Ref
  - http://ai.stanford.edu/~jkrause/cars/car_dataset.html

Data download



testing images, where each class has been split roughly in a 50-50 split. Classes are typically at the level of *Make, Model, Year*, e.g. 2012 Tesla Model S or 2012 BMW M3 coupe.

Download

Training images can be downloaded here.
Testing images can be downloaded here.
A devkit, including class labels for training images and bounding boxes for all images, can be downloaded here.
If you're interested in the BMW-10 dataset, you can get that here.

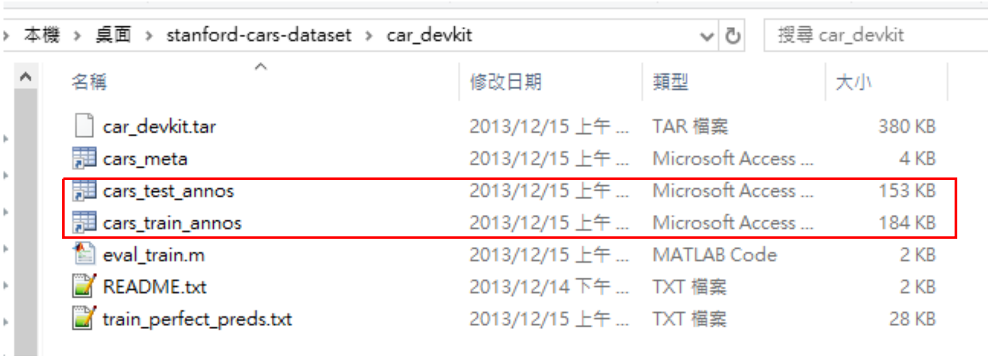
Update: For ease of development, a tar of all images is available here and all bounding boxes and labels for both training and test are available here. If you were using the evaluation server before (which is still running), you can use test annotations here to evaluate yourself without using the server.

作業需要資料

上圖為網站畫面

Data 內容

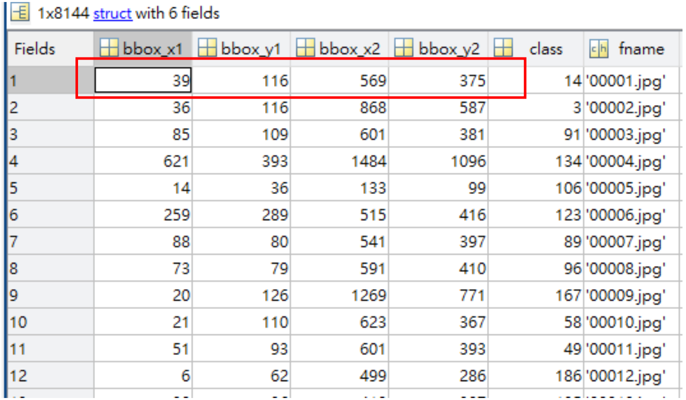
- cars_test / cars_train 資料夾：圖片擺放位置
- car_devkit：README,圖片的標記資料(包含 bbox 座標, 圖片類別) …



名稱	修改日期	類型	大小
car_devkit.tar	2013/12/15 上午 ...	TAR 檔案	380 KB
cars_meta	2013/12/15 上午 ...	Microsoft Access ...	4 KB
cars_test_annos	2013/12/15 上午 ...	Microsoft Access ...	153 KB
cars_train_annos	2013/12/15 上午 ...	Microsoft Access ...	184 KB
eval_train.m	2013/12/15 上午 ...	MATLAB Code	2 KB
README.txt	2013/12/14 下午 ...	TXT 檔案	2 KB
train_perfect_preds.txt	2013/12/15 上午 ...	TXT 檔案	28 KB

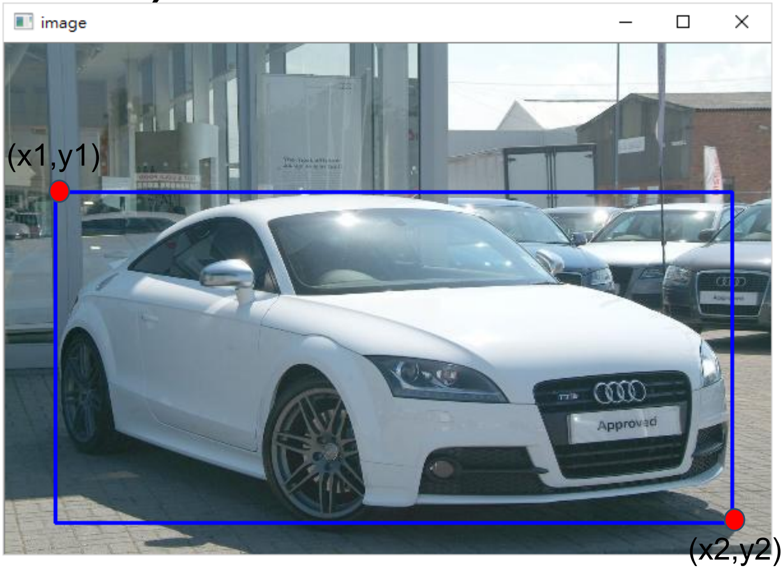
上圖為car_devkit內的檔案內容(紅框為作業需要資料)

Mat file (XXX_annos.mat)



1x8144 struct with 6 fields

Fields	bbox_x1	bbox_y1	bbox_x2	bbox_y2	class	fname
1	39	116	569	375	14	'00001.jpg'
2	36	116	868	587	3	'00002.jpg'
3	85	109	601	381	91	'00003.jpg'
4	621	393	1484	1096	134	'00004.jpg'
5	14	36	133	99	106	'00005.jpg'
6	259	289	515	416	123	'00006.jpg'
7	88	80	541	397	89	'00007.jpg'
8	73	79	591	410	96	'00008.jpg'
9	20	126	1269	771	167	'00009.jpg'
10	21	110	623	367	58	'00010.jpg'
11	51	93	601	393	49	'00011.jpg'
12	6	62	499	286	186	'00012.jpg'

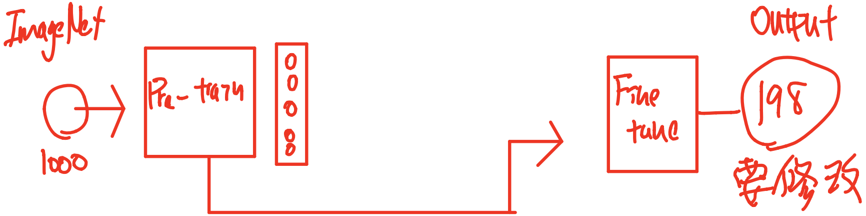


上圖為bbox的範例

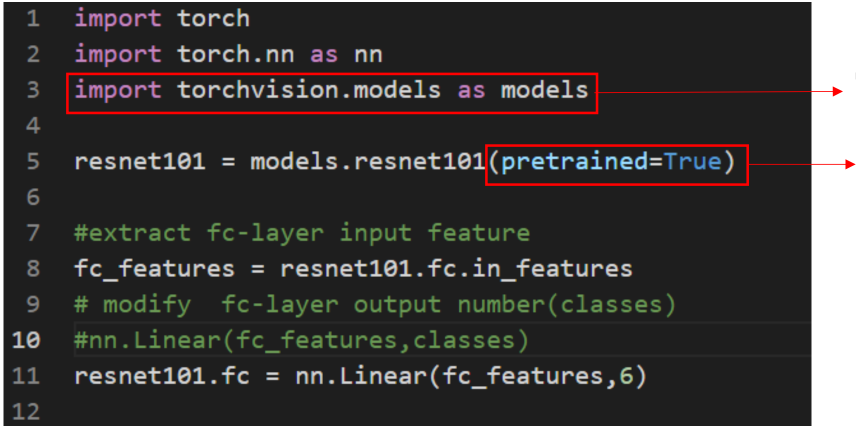
作業流程

1. 載入圖片
2. 利用mat檔，將圖片中車子crop出(利用bbox)
3. 將crop出來的圖片丟進model訓練
4. Testing model

模型架構



- 使用Resnet101



```python
import torch
import torch.nn as nn
import torchvision.models as models

resnet101 = models.resnet101(pretrained=True)

#extract fc-layer input feature
fc_features = resnet101.fc.in_features
# modify  fc-layer output number(classes)
#nn.Linear(fc_features,classes)
resnet101.fc = nn.Linear(fc_features,6)

```

官方提供的模型架構library

別人之前訓練過的初始權重

是否載入pretrained weight

Ref: https://pytorch.org/docs/stable/torchvision/models.html

Assignment #2 – Car Classification

- Use build-in model: ResNet101 for Stanford Car Classification dataset.
- You can re-use codes of Assignment #1.
- Requirement:
  - 1. Train ResNet101 model with/without pre-training weights.
  - 2. Compare your results using training loss, training/testing accuracy.

Assignment #2 – Car Classification

- You need to hand in your source code and report
- The report should cover:
  - Method description. How to run your test?
  - Experimental results
  - Discussion
  - Problem and difficulties
- Upload assignment #2 before 4/22(Mon)
- File format –zip all your files into a single file: studentID_hw1_ version, ex: 602410143_hw1_v1