

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](#).

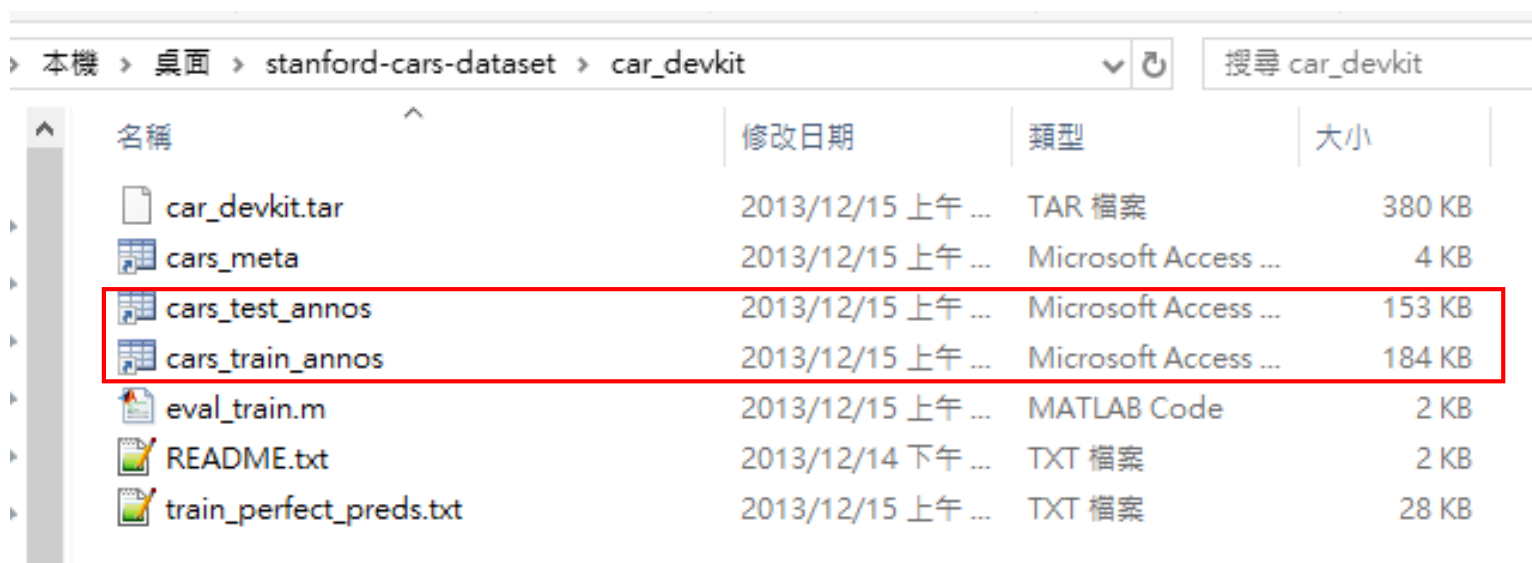
Update: For ease of development, a tar of all images is available [here](#) and all bounding boxes and labels for both training and test are available [here](#). If you were using the evaluation server before (which is still running), you can use test annotations [here](#) to evaluate yourself without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



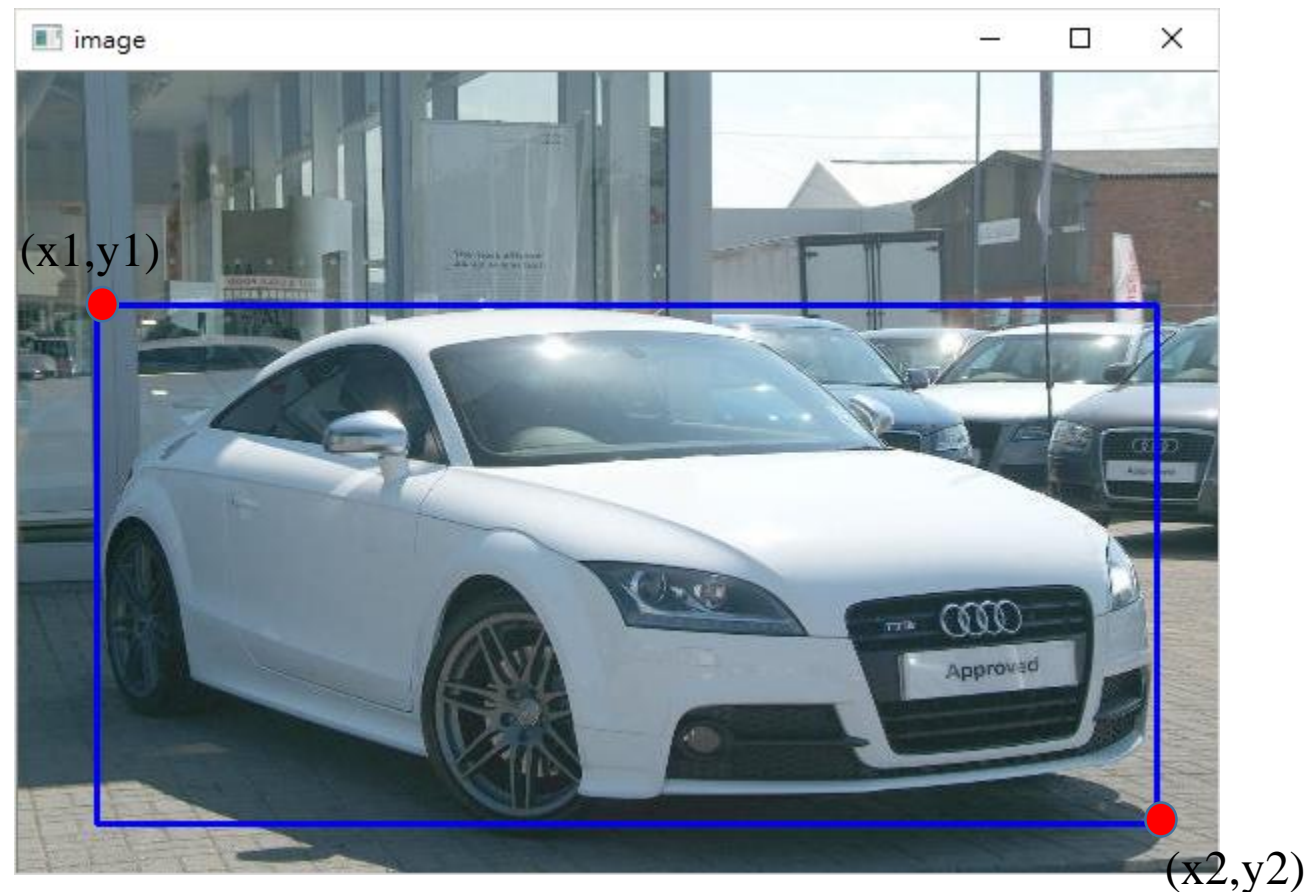
名稱	修改日期	類型	大小
car_devkit.tar	2013/12/15 上午 ...	TAR 檔案	380 KB
cars_meta	2013/12/15 上午 ...	Microsoft Access ...	4 KB
cars_test_annos	2013/12/15 上午 ...	Microsoft Access ...	153 KB
cars_train_annos	2013/12/15 上午 ...	Microsoft Access ...	184 KB
eval_train.m	2013/12/15 上午 ...	MATLAB Code	2 KB
README.txt	2013/12/14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

```
1 import torch
2 import torch.nn as nn
3 import torchvision.models as models
4
5 resnet101 = models.resnet101(pretrained=True)
6
7 #extract fc-layer input feature
8 fc_features = resnet101.fc.in_features
9 # modify fc-layer output number(classes)
10 #nn.Linear(fc_features,classes)
11 resnet101.fc = nn.Linear(fc_features,6)
12
```

官方提供的模型架構library

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