

Licence plates detection and recognition

Dejan Ljubobratović

Nikola Lopac

Marta Novak

Tamara Kopanja

Task

- **Input**
 - A digital image
- **Output**
 - Detection of licence plate in the image (bounding box) and recognition of numbers on plate
- **Requirements**
 - Plate detection involves localization of the plate (at bounding box level) and recognition of plate numbers and signs (OCR)

Dataset

- 433 images
- Bounding box annotations of the car license plates



Our approach



Images



Tensorflow Object
Detection will be used
to detect the plate
trained on a Kaggle
dataset



Easy OCR to
extract the text

Step 1

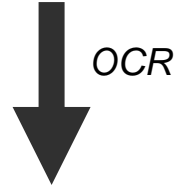


Detect and localize a license plate in an input image

Step 2



Extract licence plate
from detections



LR33 TEE

Apply Optical Character
Recognition

Detection

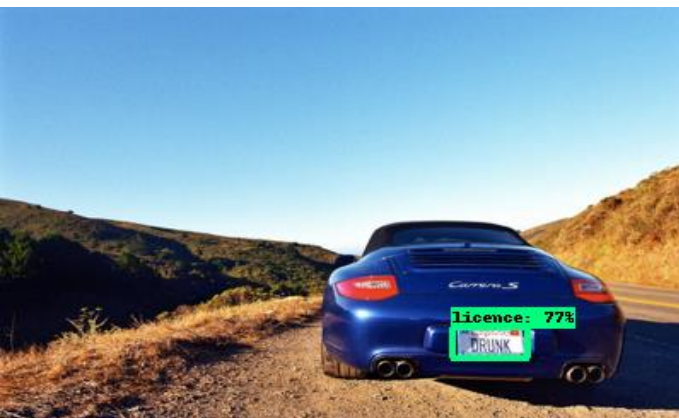
- Transfer learning
- Tensorflow Object Detection
- Pre-trained model
 - `ssd_mobilenet_v2_fpn-lite_320x320_coco17_tpu-8`
 - Trained on COCO dataset

```
INFO:tensorflow:Step 9900 per-step time 0.109s
I0714 16:15:33.726560 140086284814208 model_lib_v2.py:700] Step 9900 per-step time 0.109s
INFO:tensorflow: {'loss/classification_loss': 0.11460397,
'loss/localization_loss': 0.041974902,
'loss/regularization_loss': 0.12258186,
'loss/total_loss': 0.27916074,
'learning_rate': 0.073662736}
I0714 16:15:33.726868 140086284814208 model_lib_v2.py:701] {'loss/classification_loss': 0.11460397,
'loss/localization_loss': 0.041974902,
'loss/regularization_loss': 0.12258186,
'loss/total_loss': 0.27916074,
'learning_rate': 0.073662736}
INFO:tensorflow:Step 10000 per-step time 0.109s
I0714 16:15:44.669457 140086284814208 model_lib_v2.py:700] Step 10000 per-step time 0.109s
INFO:tensorflow: {'loss/classification_loss': 0.076435015,
'loss/localization_loss': 0.0497137,
'loss/regularization_loss': 0.12214758,
'loss/total_loss': 0.24829629,
'learning_rate': 0.07352352}
I0714 16:15:44.669854 140086284814208 model_lib_v2.py:701] {'loss/classification_loss': 0.076435015,
'loss/localization_loss': 0.0497137,
'loss/regularization_loss': 0.12214758,
'loss/total_loss': 0.24829629,
'learning_rate': 0.07352352}
```

Runtime disconnected

The connection to the runtime has timed out.

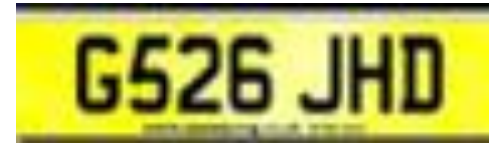
[CLOSE](#) [RECONNECT](#)





Optical Character Recognition

- EasyOCR
 - Deals with the problem of recognizing all kinds of different characters
- Filtering to grab the largest detection region





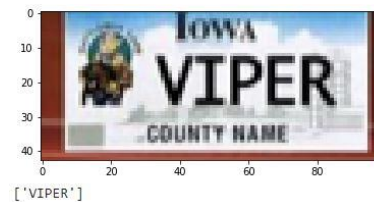
Licence plate: P3RV P



Licence plate: 172 TMJ



Licence plate: DZ17 YXR



Licence plate: VIPER



Licence plate: RI 246-RZ
Confidence: 0.9895992355266353



Licence plate: RI 246-RZ



Licence plate: H.668 J
Confidence: 0.25511712449259427



Licence plate: H.668 J

Future work

- **Detection**

- Parameter tuning
- Training



MhiL Gn 9239

- **OCR**

- Homography
- Morphological operations



hhzoe t :7596



ISKIP GAs

Questions?

