

Configuration Manual

MSc Research Project
Msc Data Analytics

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MSc Project Submission Sheet
School of Computing



Student Name: Vaibhav Aher
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Programme: MSc Data Analytics **Year:** 2019
Module: MSc Research project
Lecturer: Dr Paul Stynes
Submission Due Date: 12/08/2019
Project Title: Pedestrian detection using Retinex based image enhancement algorithm and Faster R-CNN

Word Count: **Page Count:** 7

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Configuration Manual

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1 Introduction

This manual contains all the steps to reproduce the results of the project titled “Pedestrian detection using Retinex based image enhancement algorithm and Faster R-CNN”. The system requirement and packages that required are explained step by step. For some basic setup the link of the respective website is also provided.

2 System Specification

This research carried out on Windows platform or we can execute it on Google cloud as well.

[View basic information about your computer](#)

Windows edition

Windows 10 Home Single Language

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System

Processor: Intel(R) Core(TM) i5-8250U CPU @ 1.60GHz 1.80 GHz

Installed memory (RAM): 8.00 GB (7.84 GB usable)

System type: 64-bit Operating System, x64-based processor

Pen and Touch: No Pen or Touch Input is available for this Display



[Support Information](#)

Computer name, domain, and workgroup settings

Computer name: DESKTOP-KNB7814

Full computer name: DESKTOP-KNB7814

Computer description:

Workgroup: WORKGROUP

[Change settings](#)

Windows activation

Windows is activated [Read the Microsoft Software License Terms](#)

Product ID: 00342-41300-00000-AAOEM

[Change product key](#)

Operating System Platform: Windows 10

Processor CPU: 64 bit

RAM: 8 GB or More

Graphics Card (Graphical process unit GPU): NVIDIA GeForce 940 MX (4 GB or more)

3 Install the dependencies

Download python 3.7.0

(<https://www.python.org/downloads/release/python-370/>)

The list of libraries we need to install

- 1) numpy
- 2) scikitlearn
- 3) Tensorflow 1.9.0

```
(gputest) C:\Users\Vaibhav>conda install -c anaconda tensorflow-gpu
```

```
(gputest) C:\Users\Vaibhav>python
Python 3.6.8 |Anaconda, Inc.| (default, Feb 21 2019, 18:30:04) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import tensorflow as tf
>>> print(tf.__version__)
1.9.0
>>>
```


Detailed Steps to install Tensorflow GPU

1) Check GPU compatibility on this site

- Right click on desktop
- Search NVIDIA in control panel
- Look the graphics card information
- Note down the name of GPU

System Information



 Detailed information about your NVIDIA hardware and the system it's running on.

Display Components

System information

Operating system: Windows 10 Home Single Language, 64-bit

DirectX runtime version: 12.0

Graphics card information

Items	Details
GeForce 940MX	Direct3D feature lev... 11_0
	CUDA Cores: 384
	Graphics clock: 1082 MHz
	Memory data rate: 5.01 Gbps
	Memory interface: 64-bit
	Memory bandwidth: 40.08 GB/s
	Total available grap... 8108 MB
	Dedicated video me... 4096 MB GDDR5
	System video mem... 0 MB
	Shared system me... 4012 MB
	Video BIOS version: 82.08.6C.00.1D

About

Save Close

- 2) Check whether GPU is CUDA enabled or not
- 3) Install or upgrade the drive from (www.nvidia.com/drivers)
- 4) Download the CUDA toolkit for given system form (<https://developer.nvidia.com/cuda-downloads>)
- 5) Check path in environmental variable if not then create by clicking on new environment variable.
- 6) Install Anaconda from (<https://www.anaconda.com/distribution/>)
- 7) Open anaconda prompt and Install tensor flow GPU

```
conda install -c anaconda tensorflow-gpu
```

```
(base) C:\Users\Vaibhav>conda install -c anaconda tensorflow-gpu
Collecting package metadata (repodata.json): done
Solving environment: done
```

```
## Package Plan ##
```

```
environment location: F:\Anaconda
```

```
added / updated specs:
- tensorflow-gpu
```

```
The following packages will be downloaded:
```

package	build		
-----	-----		
_tflow_select-2.1.0	gpu	3 KB	anaconda
absl-py-0.7.1	py37_0	158 KB	anaconda
astor-0.7.1	py37_0	44 KB	anaconda
ca-certificates-2019.1.23	0	158 KB	anaconda
certifi-2019.3.9	py37_0	155 KB	anaconda
conda-4.7.10	py37_0	3.0 MB	anaconda
cudnn-7.6.0	cuda10.0_0	215.3 MB	anaconda
gast-0.2.2	py37_0	138 KB	anaconda
grpcio-1.12.1	py37h1a1b453_0	1.4 MB	anaconda
ipywidgets-7.4.2	py37_0	151 KB	anaconda
jupyterlab-0.35.4	py37hf63ae98_0	10.6 MB	anaconda
jupyterlab_server-0.2.0	py37_0	40 KB	anaconda
keras-applications-1.0.8	py_0	33 KB	anaconda
keras-preprocessing-1.1.0	py_1	36 KB	anaconda
libprotobuf-3.8.0	h7bd577a_0	2.2 MB	anaconda
markdown-3.1.1	py37_0	132 KB	anaconda
mkl-service-1.1.2	py37hb782905_5	134 KB	anaconda
mock-3.0.5	py37_0	47 KB	anaconda
nbconvert-5.4.1	py37_3	460 KB	anaconda
notebook-5.7.8	py37_0	7.3 MB	anaconda
numexpr-2.6.9	py37hdce8814_0	133 KB	anaconda
openssl-1.1.1b	he774522_1	5.7 MB	anaconda
protobuf-3.8.0	py37h33f27b4_0	581 KB	anaconda
pytables-3.5.1	py37h1da0976_0	2.7 MB	anaconda
scikit-learn-0.20.3	py37h343c172_0	5.2 MB	anaconda
spyder-3.3.3	py37_0	2.7 MB	anaconda
tensorboard-1.13.1	py37h33f27b4_0	3.3 MB	anaconda
tensorflow-1.13.1	gpu_py37h83e5d6a_0	4 KB	anaconda
tensorflow-base-1.13.1	gpu_py37h871c8ca_0	218.5 MB	anaconda
tensorflow-estimator-1.13.0	py_0	205 KB	anaconda
tensorflow-gpu-1.13.1	h0d30ee6_0	2 KB	anaconda
termcolor-1.1.0	py37_1	7 KB	anaconda
widgetsnbextension-3.4.2	py37_0	1.7 MB	anaconda

- 8) Create GPU instance eg. I have created gputest
- 9) Activate gputest
- 10) Install all required packages in the console of GPU test.

```
(base) C:\Users\Vaibhav>conda list
# packages in environment at F:\Anaconda:
#
# Name                                Version                                Build      Channel
_ipyw_jlab_nb_ext_conf               0.1.0                                py37_0
_tfselect                             2.1.0                                gpu        anaconda
absl-py                              0.7.1                                pypi_0     pypi
alabaster                             0.7.12                               py37_0
anaconda                              2019.03                              py37_0
anaconda-client                       1.7.2                                py37_0
anaconda-navigator                    1.9.7                                py37_0
anaconda-project                      0.8.2                                py37_0
asn1crypto                            0.24.0                               py37_0
astor                                  0.8.0                                pypi_0     pypi
astroid                               2.2.5                                py37_0
astropy                               3.1.2                                py37he774522_0
atomicwrites                          1.3.0                                py37_1
attrs                                 19.1.0                               py37_1
babel                                  2.6.0                                py37_0
backcall                              0.1.0                                py37_0
backports                             1.0                                   py37_1
backports.os                          0.1.1                                py37_0
backports.shutil_get_terminal_size    1.0.0                                py37_2
beautifulsoup4                        4.7.1                                py37_1
bitarray                              0.8.3                                py37hfa6e2cd_0
bkcharts                              0.2                                   py37_0
blas                                  1.0                                   mkl
bleach                                 2.1                                   pypi_0     pypi
blosc                                  1.15.0                               h7bd577a_0
bokeh                                  1.0.4                                py37_0
botocore                              2.49.0                               py37_0
```

Check the installed packages by command conda list.

4 Data Extraction and Pre-Processing

These packages should be installing first

- 1) OpenCV 3.0 or updated version
- 2) Python 3.5 or updated version
- 3) NumPy 1.1 or updated version
- 4) SciPy 0.16 or updated version

Follow below sequence to Run the files

- 1) Download data manually from website
(http://www.vision.caltech.edu/Image_Datasets/CaltechPedestrians/)
Unzip all files in one folder
Give the path of annotation json file in convert_annotations.py file and
path of seq files in convert_seqs.py file

- 2) convert_annotations.py
- 3) convert_seqs.py

This will convert. seq format in to .png format for each sequential file and also extract the annotations from json file

Assign the coordinates
test_plot_annotations.py

Run the first model of FRCNN on Original data and save the results.

Now Go to Retinex for image enhancement folder

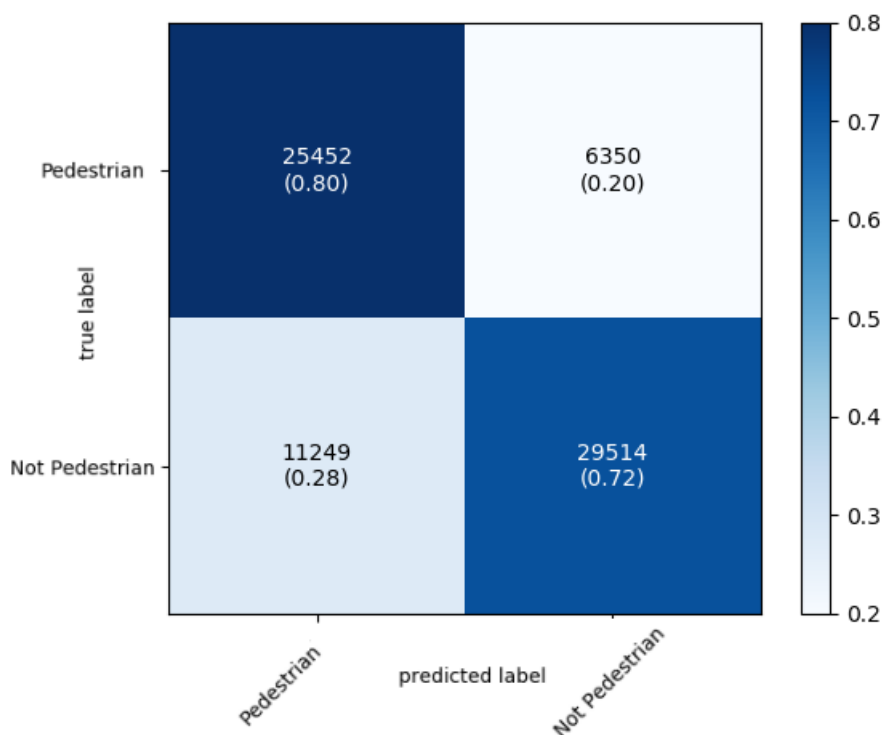
Copy all the images in to data folder and run the following command
Python3 run.py

This file will convert and save one by one enhanced images. This may take up to 8 or more hours for the same configuration system.

Once Done Copy the enhanced image data folder to FRCNN data folder

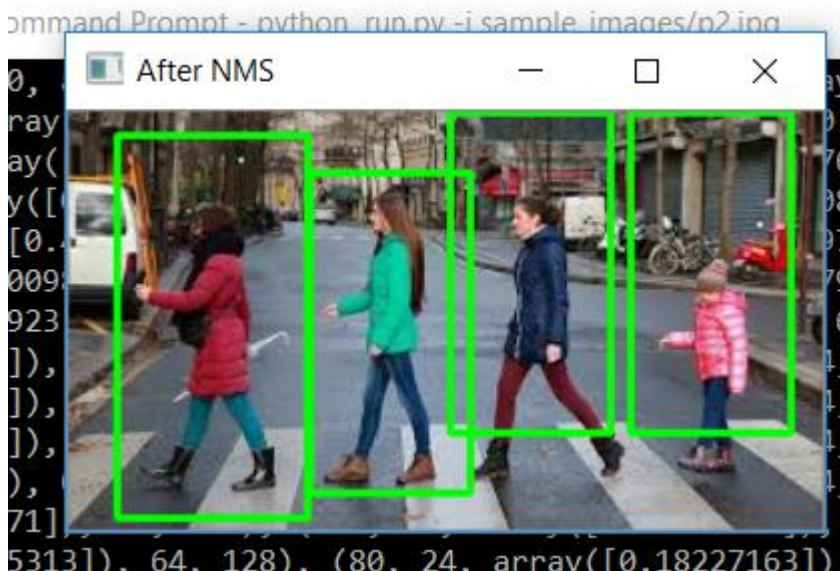
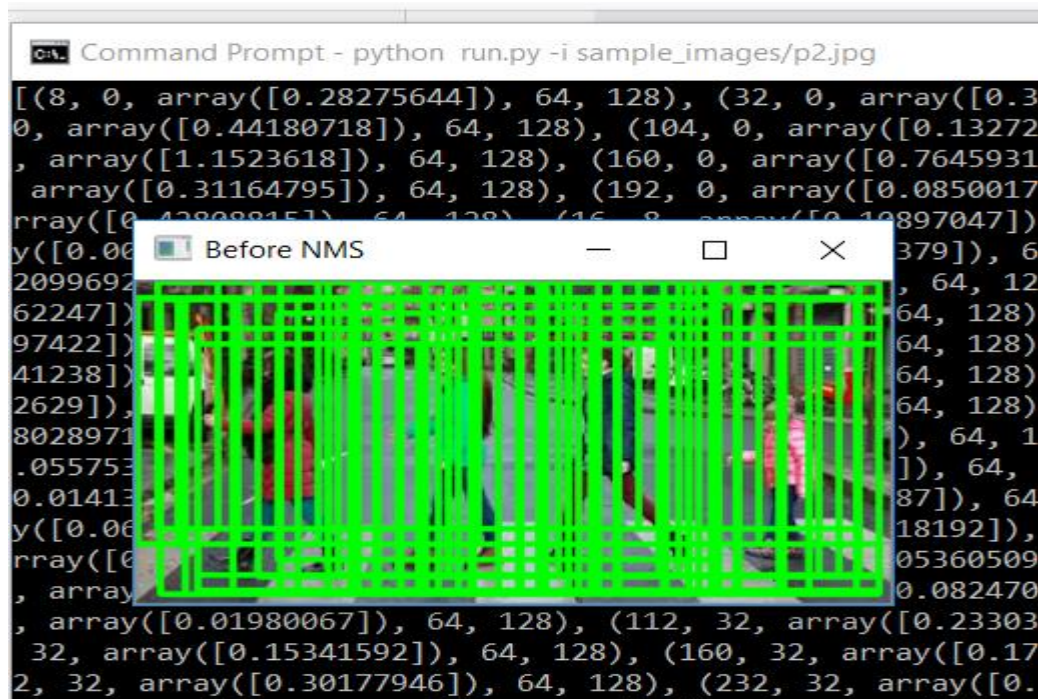
Open Anaconda command prompt and call region_proposal.py file
For training it will takes around 17 to 18 hours for same configuration system and for testing around 8 hours.

Plot the confusion matrix



The sample Non maximum suppression can be run on sample image by calling run.py file and attached path of the image.

The output result will be in the format of before and after NMS.



References

(http://www.vision.caltech.edu/Image_Datasets/CaltechPedestrians/