

CE889: Neural Networks and Deep Learning

LAB2: ASSIGNMENT INTRODUCTION
AND DATA COLLECTION

HEAD OF MODULE:

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Introduction to the assignment



Lesson Aims:

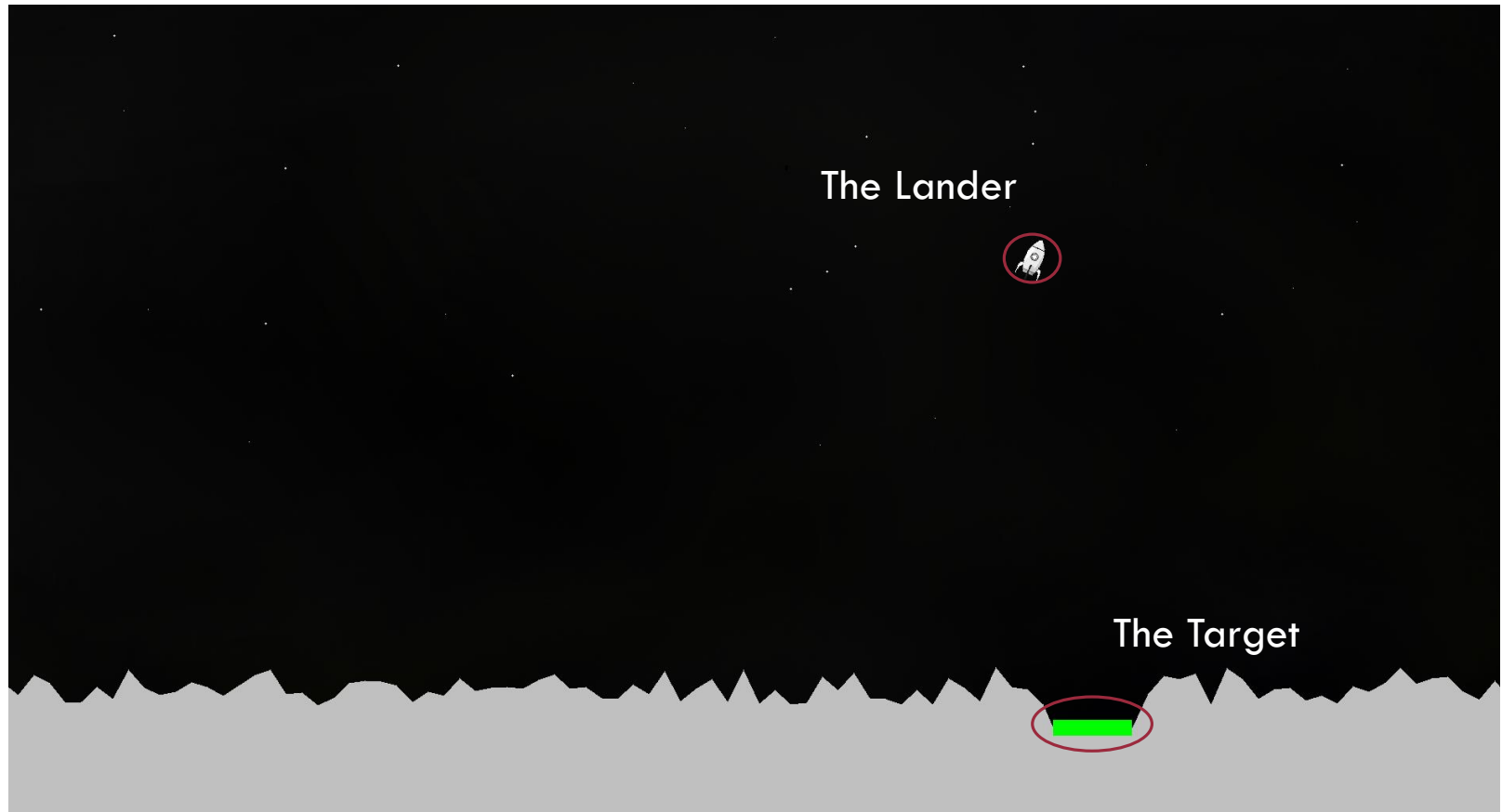
- Assignment Outline
 - The Game
 - Collecting data
 - Understanding how a NN will play the game

The objective of the game:

Steer and apply thrust to the lander.

Avoid hitting the outside edge or the ground.

Safely put the lander on the target to proceed.



The Game - Objectives

Input variables

Name	Data type	Information
X distance to target	Double	X distance in pixels to the target
Y distance to target	Double	Y distance in pixels to the target

Output variables

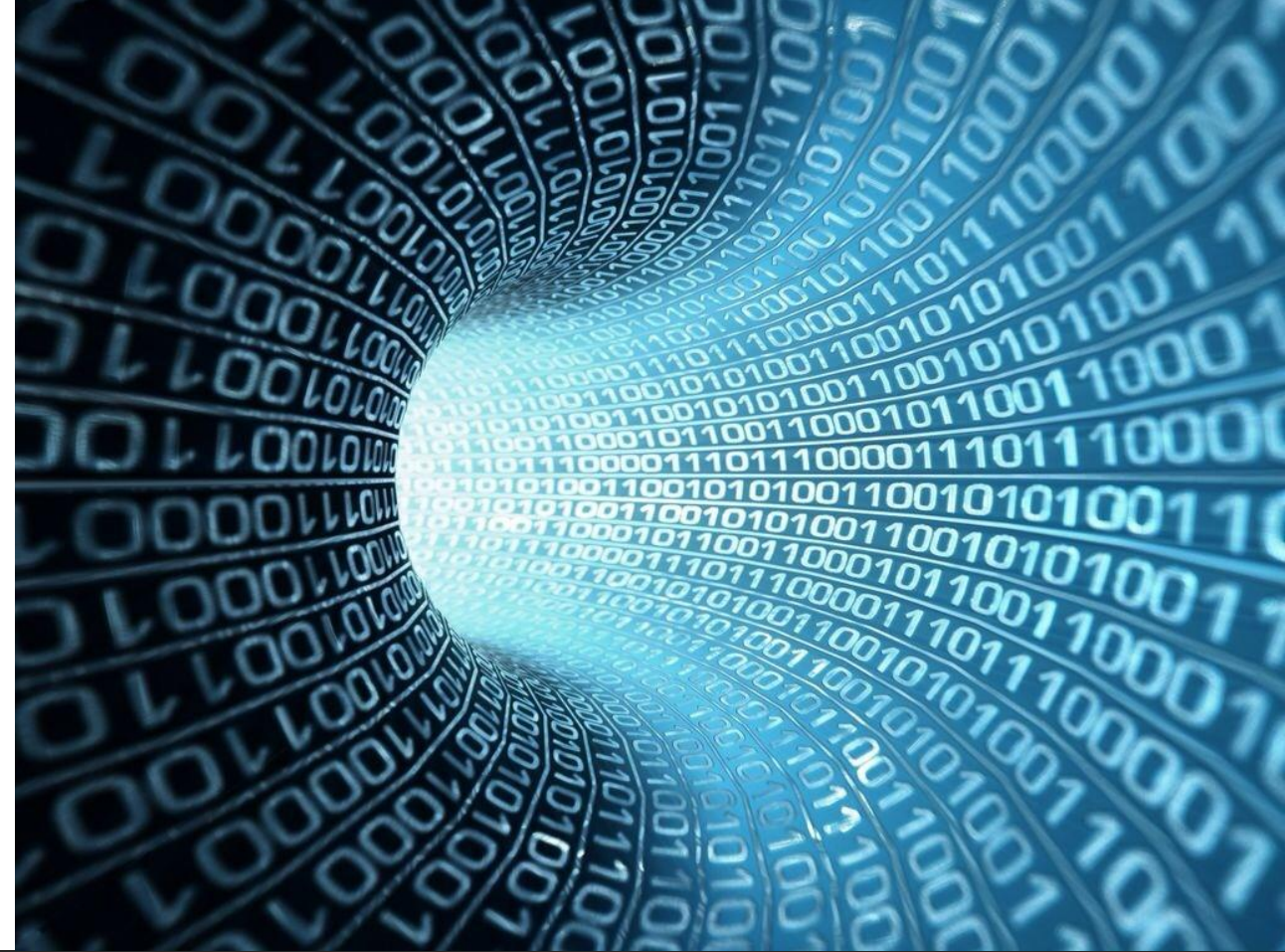
Name	Data type	Information
Velocity X	Double	Pixels per second
Velocity Y	Double	Pixels per second

Data collection - Specifics

Each run of the game is added to the same file
once the game has been closed.

The data in output to the
ce889_dataCollection.csv file

You need to collect data multiple time to ensure
there is enough data for the NN to learn from.



Data collection - Specifics

Normalisation

All data need to be scaled between 0-1

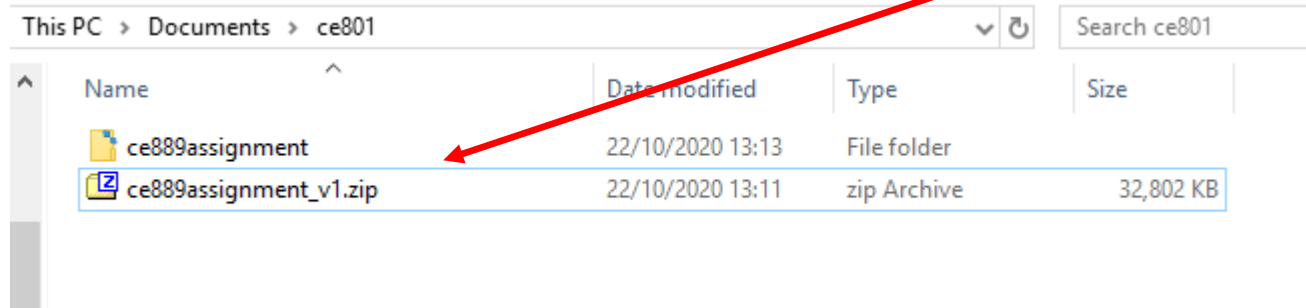
Cleaning

Any inconsistent data should be removed or replaced

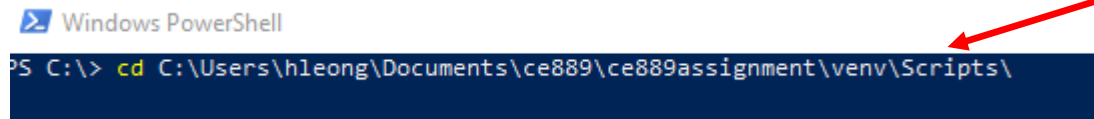
Split the Data into Training & Validation sets.



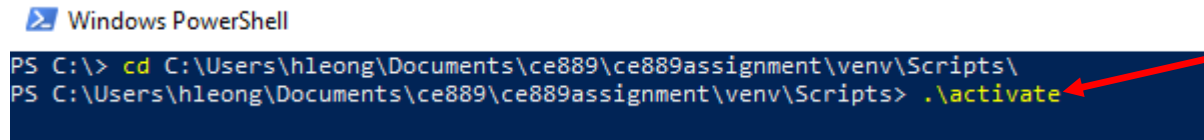
Tips for data processing



- Unzip the folder



- Open powershell
- Change directory to the folder venv/Scripts/ inside the folder you just unzip



Activate the python
virtual environment

Running the program

Windows PowerShell

```
(venv) PS C:\Users\hleong\Documents\ce889\ce889assignment\venv\Scripts> cd ../../
(venv) PS C:\Users\hleong\Documents\ce889\ce889assignment> pip install -r .\requirements.txt
Collecting pygame
  Downloading https://files.pythonhosted.org/packages/ed/56/b63ab3724acff69f4080e54c4bc5f55d1fbdeeb19b92b70acf45e88a5908
/pygame-1.9.6-cp37-cp37m-win_amd64.whl (4.3MB)
    |████████████████████| 4.3MB 1.1MB/s
Installing collected packages: pygame
Successfully installed pygame-1.9.6
WARNING: You are using pip version 19.3.1; however, version 20.2.4 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' command.
(venv) PS C:\Users\hleong\Documents\ce889\ce889assignment>
```

Go back to the main
folder of the project
Install requirements

```
(venv) PS C:\Users\hleong\Documents\ce889\ce889assignment> python .\Main.py
```

Run the project by
executing Main.py

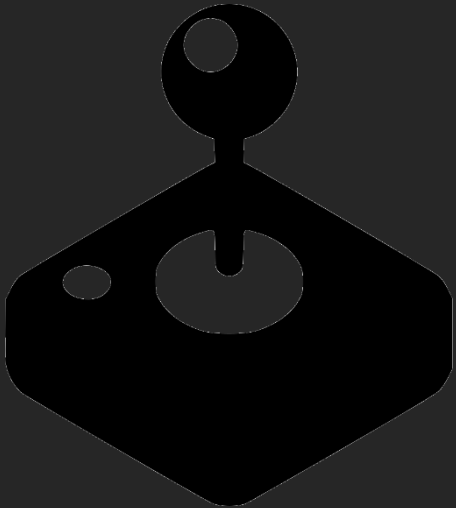
Running the program

Link to download data collection game project

https://essexuniversity-my.sharepoint.com/:f:/g/personal/ljbeas_essex_ac_uk/Es0Xyo5kcChHvMPGuDhtv38Bsyew3UfFUPTM2I9YMZRFVg?e=Rds9RC

Your Tasks...

1. Play the game and familiarise yourself with the game.



2. Play the game and collect the data for your NN.

0	1	1	0	0
1	0	1	1	0
1	1	1	1	0

3. Pre-process the data.

