National College of Ireland

Configuration Manual

MSc Research Project
MSc in Artificial Intelligence

Carlos Angel Herrera Padilla
Student ID: x21148414

School of Computing
National College of Ireland

Supervisor: Rejwanul Haque

National College of Ireland
Project Submission Sheet
School of Computing

National College of Ireland

Student Name:	Carlos Angel Herrera Padilla
Student ID:	x21148414
Programme:	MSc in Artificial Intelligence
Year:	2023
Module:	MSc Research Project
Supervisor:	Rejwanul Haque
Submission Due Date:	31/01/2024
Project Title:	Configuration Manual
Word Count:	706
Page Count:	5

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.

ALL internet material must be referenced in the bibliography section. Students are required to use the Referencing Standard specified in the report template. To use other author's written or electronic work is illegal (plagiarism) and may result in disciplinary action.

Signature:	
Date:	30th January 2024

PLEASE READ THE FOLLOWING INSTRUCTIONS AND CHECKLIST:

Attach a completed copy of this sheet to each project (including multiple copies).	☐
Attach a Moodle submission receipt of the online project submission, to each project (including multiple copies).	☐
You must ensure that you retain a HARD COPY of the project, both for your own reference and in case a project is lost or mislaid. It is not sufficient to keep a copy on computer.	☐

Assignments that are submitted to the Programme Coordinator office must be placed into the assignment box located outside the office.

Office Use Only	
Signature:	
Date:	
Penalty Applied (if applicable):	

Configuration Manual

Carlos Angel Herrera Padilla
x21148414

1 Introduction

This configuration manual file describes the necessary configuration and steps to duplicate the "Assessment of Alzheimer image detection on CNN ensemble model fine-tuned with genetic algorithm" project. This configuration manual intends to serve as a help guide process to replicate the project in the correct form.

2 System Specifications

The system specifications where the project was developed are:

- Processor: AMD Ryzen 5 6600H with Radeon Graphics @3.30 GHz,
- RAM: 24.0 GB,
- GPU: NVIDIA GEFORCE RTX 3050,
- SSD: 256 GB,
- Operating System: Windows 11 Home Edition 64-bit.

3 Software

The required software and libraries for running the project are:

- Python,
- Anaconda,
- Python IDE of choice (PyCharm recommended),
- Tensorflow,
- Keras,
- Seaborn,
- Numpy,
- Matplotlib,

- Scikit-learn,
- Pillow,
- Visualkeras.

3.1 Installation of Anaconda and Python

For the installation of Python, the Anaconda environment was selected. To install Python and Anaconda follow the steps and instructions on the official link: `https://docs.anaconda.com/free/anaconda/install/windows/` (*Installing on windows — anaconda documentation*; n.d.).

3.2 Installation of Python IDE

For the installation of a Python IDE, PyCharm was selected. The Python IDE can be anyone, but PyCharm is recommended. To install PyCharm follow the steps and instructions on the official link: `https://www.jetbrains.com/guide/python/tutorials/getting-started-pycharm/installation` (Scott; 2023).

3.3 Installation of Python Libraries

For the installation of the necessary Python libraries, open the Anaconda prompt and run the following commands:

- TensorFlow: pip install tensorflow[and-cuda],
- Keras: pip install keras,
- Seaborn: pip install seaborn,
- Numpy: pip install numpy,
- Matplotlib: pip install matplotlib,
- Scikit-learn: pip install scikit-learn,
- Pillow: pip install Pillow,
- Visualkeras: pip install visualkeras.

In Figure 1 we can see an example of how to install TensorFlow in the Anaconda prompt. The same must be done for the rest of the libraries mentioned above, one thing to consider when Anaconda is installed is that some of these libraries will be installed automatically, so there is no need to install them again.

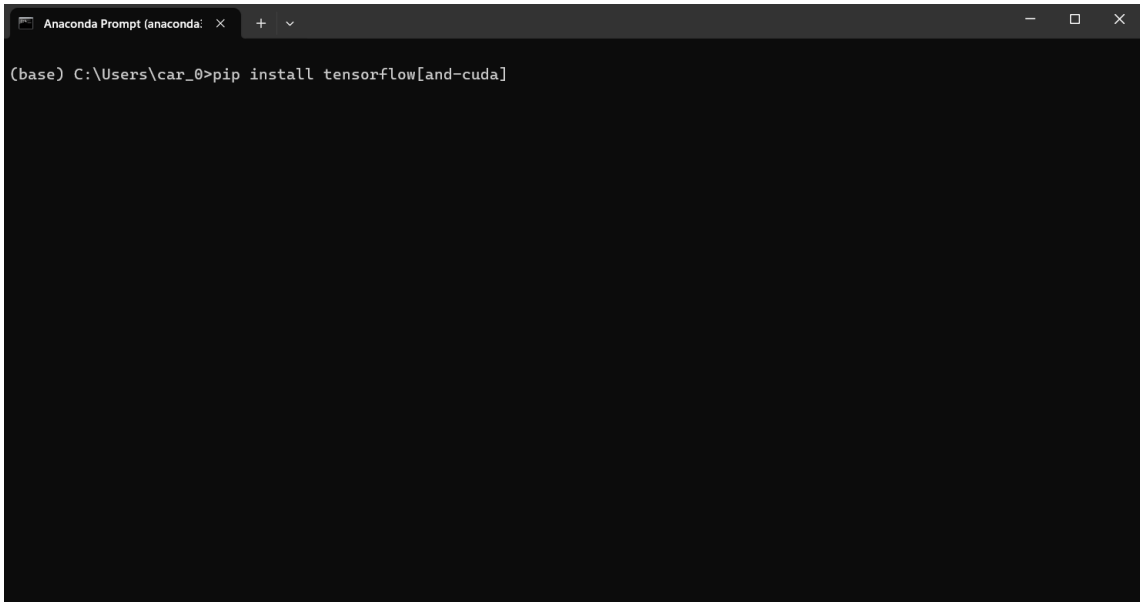

Figure 1: Example of Installing TensorFlow

4 Setting the Project in PyCharm

For setting the project in PyCharm first, we need to extract the project files from the CarlosHerreraSolutionArtifact.zip file. If the files are correctly extracted, we should see 27 items, four of which are directories (.idea, dataset, graphs, models), and 23 are the Python scripts. In Figure 2 two we can see how the project files need to be extracted so we can use them in PyCharm.

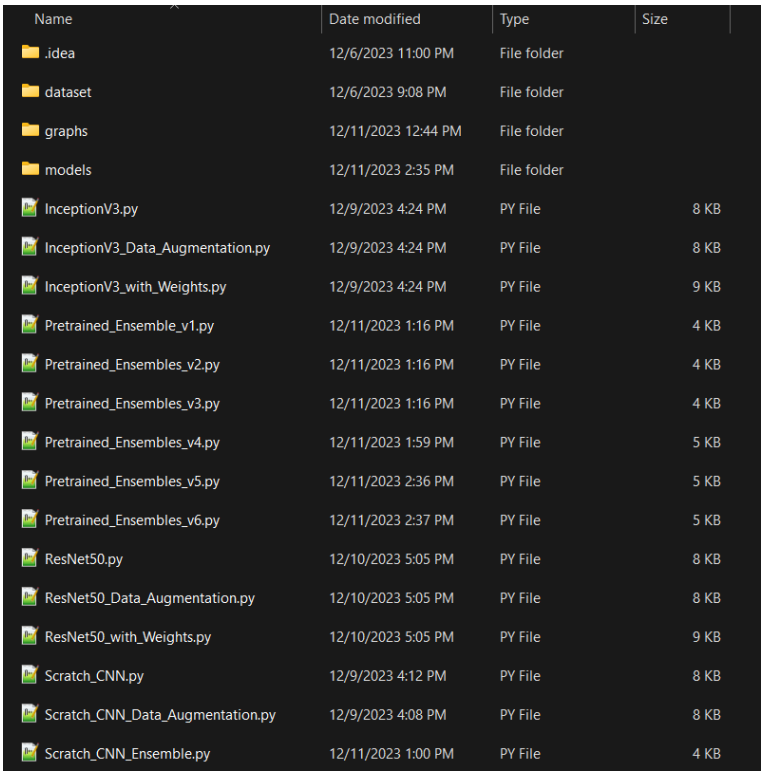

Figure 2: Project Files.

Once we have extracted all the files, we can open the project in PyCharm, go to the main menu, click open project, and select the directory where all the project files were extracted. In Figure 3 we can see how the project is supposed to look.

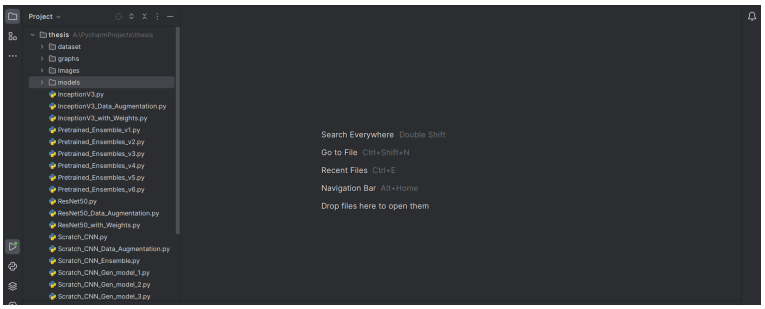

Figure 3: Imported Project in PyCharm.

After opening the project in PyCharm we can go to any .py file to run the preferred model. In these .py files, we can also make changes if we want to try something new. Each machine learning model can be modified and run, and each script will train and test the model, after that it will save the model in the model's directory and it will also save the graphs showing the performance of the model in the graph's directory. In Figure 4 and Figure 5, we can see examples on the graphs that each one of those Python scripts produced. To run the Python scripts in PyCharm we need to open the script we want to run and click "Shift + F10".

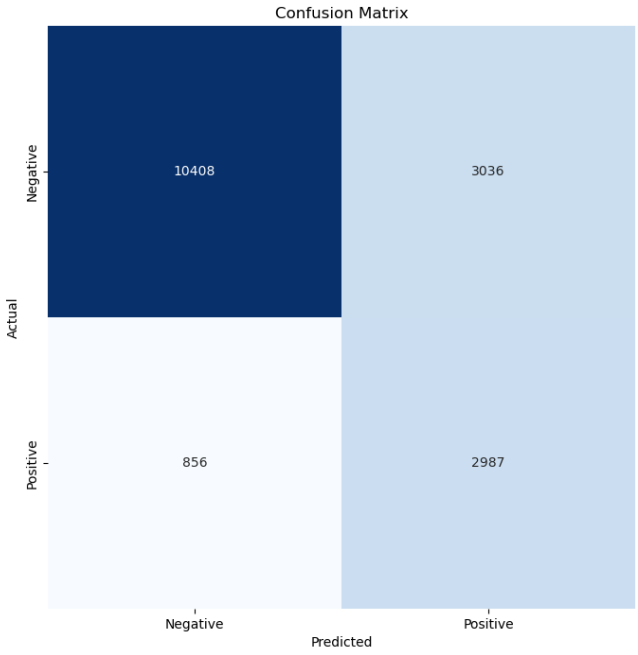

Figure 4: Confusion Matrix for the Inceptionv3.

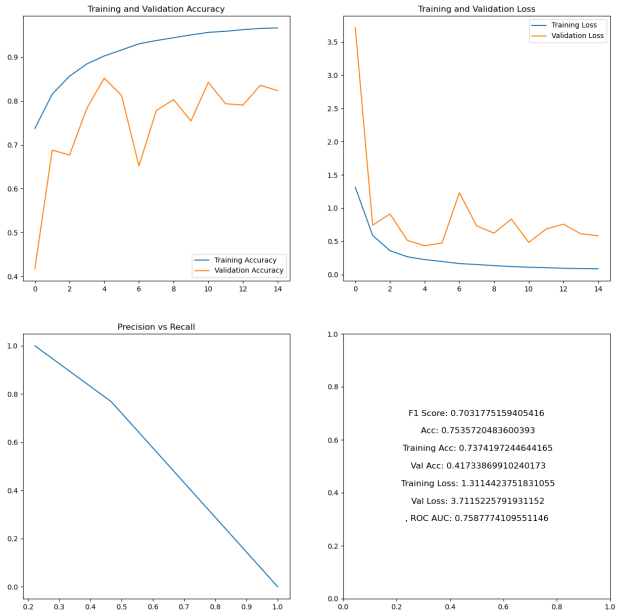

Figure 5: Ensemble model graphs.

5 Getting Dataset and Models

To get the dataset used in the project follow the next link and download the dataset.zip:

`https://studentncirl-my.sharepoint.com/:u:/g/personal/x21148414_student_ncirl_ie/EUrk0eI43_1CmB0dVkDHeRUBzy6DN5Ef2q9-vqxh9UzbYw`

To get the models you can follow the next link and download the models.zip:

`https://studentncirl-my.sharepoint.com/:u:/g/personal/x21148414_student_ncirl_ie/EdV_cP0z4RNKu_2sy8sNcB4BIUS26fQf_LwNtKwYOorcTA`

Additionally, if you do not want to download the models you can run the Python scripts in PyCharm and it will generate the models, just be careful about running the ensemble scripts after running all the individual models first.

References

Installing on windows — anaconda documentation (n.d.). `https://docs.anaconda.com/free/anaconda/install/windows/`.

Scott, H. (2023). Installation and setup, `https://www.jetbrains.com/guide/python/tutorials/getting-started-pycharm/installation-and-setup/`.