29/07/2024 – 09/08/2024

Nuffield Summer Research Placement

Emotion Recognition with AI, Computer Vision & Python

Monday, 29th July – On-Campus Workshop

Workshop Content

[1] Introduction to AI

[2] Image Data & Computer Vision

[3] AI Ethics & Safety

[4] Coding Setup

Workshop Schedule

10:00 – Students Arrive; Tour of Campus (45 minutes)

10:45 – Introduction to DAIM (15 minutes)

11:00 – [1] Introduction to AI (45 minutes)

11:45 – Lunch (45 minutes)

12:30 – [2] Image Data & Computer Vision (45 minutes)

13:15 – [3] AI Ethics and Safety (45 minutes)

14:00 – [4] Coding Setup (1 hour)

15:00 – Final Thoughts, Virtual Arrangements, and Placement Structure (30 minutes)

15:30 – Workshop Close

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Tuesday, 30th July – Virtual Workshop

Workshop Content

[1] Python Programming & AI

[2] Image Data & Preprocessing

Workshop Schedule

10:00 – Python Programming & AI (2 hours)

11:00 – Image Data & Preprocessing (2 hours)

14:00 – Final Thoughts and Q&A (30 minutes)

14:30 – Workshop Close

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Thursday, 1st August – Virtual Workshop

Workshop Content

[1] Computer Vision and CNNs

[2] AI Ethics and Safety

Workshop Schedule

10:00 – [1] Computer Vision and CNNs in Python (2 hours)

12:00 – [2] AI Ethics and Safety (2 hours)

14:00 – Final Thoughts and Q&A (30 minutes)

14:30 – Workshop Close

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Preliminaries

Python Programming

Before starting your placement, it will be useful to brush up on the Python Programming Language if this is your first encounter with it.

https://www.learnpython.org/

It is recommended to get familiar with the 'basics' found in this tutorial. All code is conveniently written in the browser. Variables, Types, Operators, Lists, and Loops will form the core of the code you produce with us. We will also be working with various Python 'libraries' during the placement; it is recommended to get familiar with the basics of 'pip', and the 'Python Import System'.

The specific libraries you are likely to encounter and work with can be found on the next page of this document. If you have the chance, have a look at them and try and get familiar with their purpose; What do they do? Why are they relevant to the project? We will of course cover these questions, but familiarity will go a long way in the short time you have with us!

Learning a Programming Language in just short of two-weeks is a huge task; and we do not expect it to be achieved with ease. Throughout your placement, you will have the opportunity to learn, debug, understand, and decipher the Python Programming Language with our assistance. If you are stuck, confused, or unsure, that's fine! We and your fellow project participants will get to the bottom of it. Our contact details and working hours during the placement can be found at the bottom of this document; do not hesitate to reach out!

Relevant Articles

We recommend reading the following short articles before your placement begins to get familiar with the basic terminology you'll encounter during your placement. Rest assured, should you not have the chance to read everything, or simply not understand it, your workshop sessions with us will cover the essentials!

Artificial Neural Networks:

https://www.turing.com/kb/importance-of-artificial-neural-networks-in-artificial-intelligence

Computer Vision:

https://www.turing.com/kb/all-you-need-to-know-about-computer-vision

Deep Learning:

https://www.ibm.com/topics/deep-learning

Computer Vision and Image Processing:

https://opencv.org/blog/computer-vision-and-image-processing/

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Useful Links

Python Documentation:

Information regarding the Python Programming Language can be found here.

Information regarding PIP, the Python package manager, can be found here.

Jupyter Notebook Documentation:

Information regarding Jupyter Notebook can be found here.

Kaggle:

Information regarding Kaggle can be found here.

Python Libraries

NumPy: https://numpy.org/

PIL: https://pillow.readthedocs.io/en/stable/

MatPlotLib: https://matplotlib.org/stable/tutorials/index

Keras: https://keras.io/

TensorFlow: https://www.tensorflow.org/

PyTorch: https://pytorch.org/

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Supervisor Contact Information

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