Pearse Murphy

Personal Website - linkedin.com/in/pearse-murphy-31b678230 - github.com/murphp30 - ORCiD

SKILLS

Core: Data science, data engineering, software engineering, data analysis, data visualisation, machine learning, statistical analysis, data modeling, risk modeling, deep learning, outlier detection, computer vision, time series analysis

Programming and Markup Languages: Python, Bash, SQL, C, JavaScript, Rust, C++, Go, LaTeX, HTML, CSS, PHP

Libraries and Tools: Numpy, SciPy, Jupyter, Tensorflow, Matplotlib, PyTorch, scikit-learn, Pandas, Django, OpenCV, Git, Docker, Google Cloud, Linux

Other: Oral and written communication, independently driven research, technical writing, quick learner, problem solving, organised, self-starter, mentorship, time management, stakeholder management, collaboration, science outreach

EDUCATION

Trinity College Dublin and Dublin Institute for Advanced Studies **Dublin, Ireland**

Ph.D. Solar Physics *September 2017 - February 2022*

Thesis: Probing the Solar Corona at High Temporal and Spatial Resolution with the Low Frequency Array.

Trinity College Dublin **Dublin, Ireland**

B.A. (Mod.) Physics and Astrophysics, First Class *September 2013 - May 2017*

Thesis: A Statistical Analysis of "EIT Waves" and the Solar Phenomena Associated with them.

WORK EXPERIENCE

Quantitative Finance Analyst

Bank of America, London, United Kingdom *November 2024 - October 2025*

- Used Python to perform data analysis and software development for financial risk models.
- Produced clear and concise technical documentation to accompany model development.
- Engaged with business and technical stakeholders throughout model development cycle.
- Further refined my presenting to both technical and non technical audiences.

Postdoctoral Researcher

University of Galway, Galway, Ireland *May 2024 - November 2024*

- Rapidly learned how to use Pytorch and Google Earth Engine to analyse remote sensing EO data. Within my first month I had learned how to use new tools commonly used in EO data analysis.
- Used Python to perform extract, transform, load operations on EO data for use with a machine learning (ML) model that forecasts crop resilience to climate change.
- Optimised Python data analysis software resulting in a 20 times speed increase. I contributed to open source software to increase the computational efficiency so that code that once took days to run now takes minutes.
- Broadened my network of EO experts at the AI4Copernicus conference.

Postdoctoral Researcher

Observatoire de Paris, Meudon, France *April 2022 - April 2024*

- Developed and implemented a new ML model using TensorFlow in Python to perform outlier detection in large volumes of data. Significantly reduced the time to do so compared to existing manual methods from days to minutes. This work resulted in two peer-reviewed publications.
- Experimented with unsupervised ML methods for object segmentation such as Variational Autoencoders. While this saw some success, the time critical nature of the project required a different approach using manually labelled data.
- Designed and implemented a database of solar radio observations identified by ML model described above. The database can be queried with SQL and delivers solar radio data to the research community.
- Presented my research at prominent scientific conferences throughout Europe such as the International Workshop on Machine Learning and Computer Vision in Heliophysics. Tailored talks to audiences of mixed scientific and nonscientific backgrounds.

Ph.D. Researcher

Trinity College Dublin and Dublin Institute for Advanced Studies, Dublin, Ireland *September 2017 - February 2022*

- Used Python on High Performance Computing and Cloud platforms to analyse large, complex datasets. I transformed terabytes of raw radio astronomy data into scientific insight which resulted in two publications in prominent academic journals.
- Used Markov chain Monte Carlo and other statistical methods to model large volumes of data from the Sun. This lead to the publication of my first research paper.
- Designed unique data visualisation for complex datasets with Matplotlib. This allowed for more rigorous analysis of solar radio data in a way that had not been done before.
- Honed my oral communication skills by presenting to experts at international conferences and giving a wide variety of science outreach talks to members of the public from diverse backgrounds.

Lead Educator

Trinity Walton Club, Dublin, Ireland *September 2017 - June 2019*

- Designed and taught a physics and maths syllabus for Trinity Walton Club, a STEM club for 12-17 year olds.
- Explained more advanced topics in physics and maths at an appropriate level for younger students.
- Managed group research projects. Acted as a mentor, providing materials and expertise necessary for each group to conduct their research and present it to an audience including academic staff at Trinity College Dublin.

Laboratory Teaching Assistant

Trinity College Dublin School of Physics, Dublin, Ireland *September 2017 - June 2019*

- Demonstrated for undergraduate physics laboratories for Junior Sophister (3rd year) students.
- Responsible for troubleshooting laboratory equipment and ensuring students understood the task at hand.
- Taught a breadth of fundamental and applied concepts in physics, as well as experimental techniques and how to operate laboratory equipment safely.
- Adapted my teaching style depending on a student's level of knowledge.

Tour Guide

City Sightseeing, San Francisco, USA *July 2015 - September 2015*

- Led 2-3 hour long hop-on-hop-off tours from an open top bus to groups of ~ 50 people. These included multiple routes across San Francisco e.g. Downtown, Golden Gate Park and the Golden Gate Bridge. Engaged with guests as they embarked and disembarked from the tour. Recommended nearby restaurants and attractions.
- Led 1-2 hour long walking tours to small groups around historic neighbourhoods e.g. Chinatown.
- Actively promoted the tour to passersby and regularly earned commission for meeting weekly sales targets.

FIRST AUTHOR PUBLICATIONS

- Regional-Scale Analysis of Soil Moisture Content in Malawi Determined by Remote Sensing Remote Sensing 17, no. 5: 890 - 2025
- Semantic Segmentation of Solar Radio Spikes at Low Frequencies The Open Journal of Astrophysics, vol. 7, id. 51 - 2024
- Automatic detection of solar radio bursts in NenuFAR observations Proceedings of the 9th International Workshop on Planetary, Solar and Heliospheric Radio Emissions - 2023
- First results from the REAL-time Transient Acquisition backend (REALTA) at the Irish LOFAR station Astronomy & Astrophysics, vol. 655, id. A16 - 2021
- LOFAR observations of radio burst source sizes and scattering in the solar corona Astronomy & Astrophysics, vol. 645, id. A11 - 2021

AWARDS AND ACHIEVEMENTS

- Winner of best short talk at the Irish National Astronomy Meeting - 2019
- Awarded gold medal for exceptional merit at degree examinations - 2017
- Recipient of the Irish Research Council Government of Ireland Postgraduate Scholarship - 2017

PERSONAL INTERESTS

Cycling, amateur dramatics, choral singing