Pearse Murphy, Ph.D.

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Summary

Postdoctoral researcher/data scientist using **machine learning** to monitor climate change from earth observation data. Research contributions include the **end-to-end development** of a state-of-the-art ML model to detect solar radio emission and six publications in leading academic journals. Extensive experience in **scientific computing**, **data analysis** and **data visualisation** with 10+ years using **Python**. Seeking to apply my strong **technical**, **communication** and **problem solving** skills in a collaborative data science role.

Experience

2024 – Present **Postdoctoral Researcher/Data Scientist.** School of Natural Sciences, University of Galway, Ireland.

- Used Pytorch and Google Earth Engine to design and train a machine learning (ML) model on earth observation data to monitor the resilience of rice paddies to climate change.

2022 – 2024 **Postdoctoral Researcher.** LESIA, Observatoire de Paris, France.

- Developed and implemented a new ML model using TensorFlow to automatically detect solar radio emissions. Significantly reduces time compared to previous, manual methods. Resulted in two peer-reviewed publications.
- 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. Tailored talks to audiences of mixed scientific backgrounds.

2017 – 2022 **Ph.D. Researcher.** Trinity College Dublin and Dublin Institute for Advanced Studies, Ireland.

- Used Python and High Performance Computing to analyse large datasets to transform terabytes of raw radio astronomy data into scientific insight. Resulted in two publications in prominent academic journals.
- Used Markov chain Monte Carlo methods to model solar radio data and designed a unique data visualization with Matplotlib. This lead to the publication of my first research paper both due to its novel approach and rigorous analysis.
- Honed my oral communication skills by presenting to experts at international conferences and giving a wide variety of science outreach talks to all members of the public.

Education

2017 – 2022 **Ph.D., Trinity College Dublin and Dublin Institute for Advanced Studies** Solar Physics.
Thesis title: *Probing the Solar Corona at High Temporal and Spatial Resolution with the Low Frequency Array.*

- Developed and installed a computing backend for Ireland's most advanced radio telescope. This allows for the recording and processing of data at the highest time resolutions.

2013 – 2017 **B.A. Mod., Trinity College Dublin** Physics and Astrophysics.
Thesis title: *A Statistical Analysis of "EIT Waves" and the Solar Phenomena Associated with them*.

- Awarded gold medal for exceptional merit at degree examinations.

Skills

Core: Oral and written communication, independently driven research, teaching, software engineering, version control with git.

Coding:

Miscellaneous

Awards and Achievements

Winner of best short talk at the Irish National Astronomy Meeting 2019.

Recipient of the Irish Research Council Government of Ireland Postgraduate Scholarship.

Personal Interests

Cycling, musical theatre, choral singing.