

HATTIE STEWART

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SUMMARY

I am a PhD candidate in ML for Astrophysics with a background in software engineering, and have submitted my thesis for defense. I am highly committed to software best practices. I am particularly interested in the use of unsupervised methods to extract information from large data sets without the need of contextual information; using the power of ML to let the data speak for itself.

PROFICIENT SKILLS

Languages: Python, SQL

Technologies: Git, GitHub, TensorFlow, PyTorch, Keras, SciPy, NumPy, Pandas, Scikit-learn, Jupyter, Matplotlib, Django, CI, CD, TDD, venv, LaTeX, JIRA, Trello, Agile, Docker, REST API, OpenAPI

PROFESSIONAL EXPERIENCE

- 2022 **Industry Placement - SciML group** **Rutherford Appleton Laboratory**
- Investigating VAEs and AEs applied to scientific data sets for image segmentation.
TensorFlow / Keras / PyTorch / Numpy / Pandas
- 2019 - 2022 **Freelance Software Engineer** **Uncommon Correlation**
- Python and Django back-end development for data governance and secure data processing systems.
- 2018 - 2019 **Software Engineer** **Omni Digital**
- Back-end development, building robust systems in Python and Django. Experience creating and implementing an open API specification. OOP, using modern tools/technologies.
 - Front-end engineering and infrastructure experience.
 - Committed to best practices, including comprehensive unit and function testing, as well as smoke tests and peer review.
 - Experience in leading and working under Agile project management method.
 - Project lead on, and assisted in pitching for, Google funded project; involving assisting in project and team management, making technical decisions and client liaison.
Python / TDD / pytest / unittest / Travis CI / CD / Django / Wagtail / PostgreSQL / HTML / Django Templates / CSS / Stylus / Ansible / Docker / Terraform / Digital Ocean / JIRA / REST API / OpenAPI
- 2017 - 2018 **Programmer** **WebTMS**
- Continuous development of the WebTMS system, both back-end and front-end development.
 - Data migration and database administration.
 - Providing first line technical support and training to clients and agents.
T-SQL / JavaScript / ASP.Net / VB.NET / JQuery / HTML / CSS / Visual Studio / IIS / TFS

EDUCATION

- 2019 - present **PhD Candidate** **University of Bristol**
- UKRI Centre for Doctoral Training in Artificial Intelligence, Machine Learning & Advanced Computing
Mark Birkinshaw, Natasha Maddox & Ben Maughan
- PhD Project: Using ML image segmentation methods to extract astrophysical objects and their information from next generation radio survey data, in particular the Square Kilometre Array (SKA). Development of a radio image segmentation pipeline for extremely large data sets, ContinUNet, using U-Net as segmentation method.
 - Experience in Bayesian statistics, data science techniques, computer vision and image segmentation tasks.
Python / R / NumPy / Pandas / SciPy / OpenCV / Scikit-learn / TensorFlow / Keras / PyTorch / Docker / DockerHub / HPC / CNNs / AEs / VAEs / Matplotlib / Seaborn / Git / pipenv / Linux
- 2012 - 2016 **MPhys Physics with Astrophysics 2.1 (hons)** **The University of Manchester**
- MPhys project: Design and development of an extensive software system in Python to automate the operation of a remote control telescope, including reduction and analysis of collected data.
- 2010 - 2012 **A Levels** **The Thomas Hardy School**
- A-levels: A*AA in Mathematics, Physics and Chemistry respectively.
AS-levels: A in Music and B in Further Mathematics. Extended project: A*
- 2007 - 2010 **GCSEs** **The Purbeck School**
- 10 GCSEs, including 5 A's and 5As with Science, Mathematics and English to A* grade.

PUBLICATIONS

Submitted	ContinUNet: Deep Radio Image Segmentation in the SKA Era with U-Net <i>Royal Astronomical Society Techniques & Instruments (RASTI)</i> Hattie Stewart, Mark Birkinshaw, Jason Yeung, Natasha Maddox, Ben Maughan, Jeyan Thiyaalingam	Journal
Published	Radio Image Segmentation with Autoencoders <i>Proceedings of the ML4Astro International Conference</i> Hattie Stewart, Jason Yeung, Mark Birkinshaw	Conference Proceedings
Accepted	Deep Radio Image Segmentation <i>IAU Symposium 368 Proceedings</i> Hattie Stewart, Mark Birkinshaw, Jason Yeung	Conference Proceedings

CONFERENCES

September 2023	BCRS MIGHTEE Symposium Radio Image Segmentation in the SKA Era with U-Net	Talk
July 2023	National Astronomy Meeting Radio Image Segmentation in the SKA Era with U-Net	Talk
November 2022	Workshop for Korea-UK AI/ML Research in Fundamental Sciences Deep Image Segmentation of the Radio Sky	Talk
July 2022	National Astronomy Meeting Radio Image Segmentation with Variational Autoencoders	Poster
June 2022	Machine Learning for Astrophysics Radio Image Segmentation with Autoencoders	Poster and Flash Talk
June 2022	AIMLAC Artificial Intelligence Conference Radio Image Segmentation with Autoencoders	Talk

TEACHING EXPERIENCE

2020 - 2022	Teaching Assistant Introductory Scientific Computing, Cosmology, Introduction to Computational Physics, Computational Physics	University of Bristol
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ADMINISTRATIVE EXPERIENCE

September 2023	Local Organising Committee - BCRS MIGHTEE Symposium	University of Bristol
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PUBLIC ENGAGEMENT & OUTREACH

2020 - 2023	Co-Founder and Programme Manager A student led initiative that provides voluntary data science consultancy to a group of selected charities (see website). I co-founded the programme and have co-ordinated 3 events (1 virtual and 2 hybrid).	DataAid
July 2021	Written in the Stars Free Zoom event aimed at Year 9 to Year 11 students, gave a short talk on my research.	Aersospace Bristol
June 2021	Hareclive in Space - Workshop Workshop at a local primary school (Hareclive Academy), engaging with student's questions and ideas about space.	We The Curious
2015 - 2017	Public Events Coordinator UMPO is a student run organisation that aims to encourage young people into science through interactive workshops. As Public Events Coordinator, my main role was to co-manage the organisation of a Physics outreach show.	University of Manchester Physics Outreach (UMPO)

CERTIFICATIONS, SCHOLARSHIPS & TRAINING

- Introduction to .NET Programming** - Java Consult
- Undergraduate Science Scholarship** - The Ogden Trust