

Dr. Rob Lyon

Department of Computer Science, Edge Hill University, Ormskirk, Lancashire, L39 4QP, United Kingdom
lyonro@edgehill.ac.uk | <http://www.scienceguyrob.com>



NATIONALITY

BRITISH & IRISH (UK & EU NATIONAL)

EDUCATION

UNIV. OF MANCHESTER

PH.D. MACHINE LEARNING

Sept. 2011 - Sept. 2015

UNIV. OF LIVERPOOL

M.Sc. ADVANCED COMPUTER SCI.

Aug. 2010 - Sept. 2011 | Distinction

B.Sc. SOFTWARE DEVELOPMENT

Sept. 2004 - July. 2008 | 1st Class

EDGE HILL UNIVERSITY

PGCERT IN HIGHER EDUCATION

Sept. 2019 - Feb. 2022

FUNDING

- Amazon **Astro Compute Grant** (value equal to £20,000). Outcomes include the paper, "**A Big Data Pipeline for High Volume Scientific Data Streams**".
- Principal investigator for a £16,000 initiative funded by the STFC, employing machine learning for radiotherapy treatment. Information available [online](#).

AWARDS

2008

Best Final Year Software Project,
University of Liverpool.

2007

Deloitte Award for Best Group Project,
University of Liverpool.

2021

Nominated for student led "Teaching Hero" award, Edge Hill University.

EXPERIENCE

DEPARTMENT OF COMP. SCI. | SENIOR LECTURER IN AI & ROBOTICS

Sept. 2019 – Present | Edge Hill University, UK

- Programme leader for 5 undergraduate degree pathways.
- Leader of 5 undergraduate modules. Taught over 700 undergraduate students in subject areas ranging from introductory programming to machine learning.
- Achieved the highest levels of student satisfaction in the department, as measured during student pulse surveys. Successfully re-developed modules with poor levels of student satisfaction & performance.
- Author and teacher of machine learning, data science and Python courses for the Institute of Code's TechUP Women and Bootcamp programmes.
- Delivered extracurricular master classes to students at all levels. Heavily involved in outreach and open day activities.
- Other responsibilities - outreach officer, diversity & equality committee, seminar organisation.

SCHOOL OF PHYSICS & ASTRONOMY | ML RESEARCHER

Sept. 2015 – Sept. 2019 | University of Manchester, UK

- Machine learning lead for the Square kilometre Array (SKA) group. Developed new machine learning methods for radio astronomy.
- Helped design the analytic pipelines for the SKA telescope.
- Reported SKA project progress to consortia leads, managed sub-element requirements and test specifications.
- Collaborated with academic colleagues and industry stakeholders to tackle SKA design challenges, delivered talks describing design work when required.
- Developed prototype processing pipelines for the design consortia.
- Re-architected off-line processing procedures, enabling their on-line execution across heterogeneous compute facilities.
- Assisted procurement of prototype HPC cluster (value approx. £250,000).
- Co-supervised PhD and masters students working in machine learning.
- Organised and led multiple data science workshops for medical researchers.

SCHOOL OF COMPUTER SCIENCE | RESEARCHER

Sept. 2011 – Sept. 2015 | University of Manchester, UK

- Awarded a fully funded position (awarded by EPSRC) in the first UK-based centre for doctoral training specialising in computer science.
- Studied the challenges associated with isolating signals of interest in radio data, as part of the Physics department in Manchester.
- Devised machine learning classifiers able to accurately identify signals of interest in high volume data streams.
- Discovered many new Radio Pulsars (a rare type of star) via my work.
- Specialised in stream mining, imbalanced learning, and feature engineering.

APPSENSE INC. (NOW IVANTI) | SOFTWARE ENGINEER

July 2008 – August 2010 | Daresbury, UK

- Responsible for analysing software performance and scalability.
- Developed test harnesses for multi-tier client-server architectures.
- Studied performance data, produced summary reports/white-papers for non-technical staff, made recommendations to management.
- Led the performance team prior to leaving for further university study.

SELECTED TALKS

2016

“Machine Learning & Science Data Processing” @ SKA Delivering the Science, University of Cambridge.

2017

“50 Years of Candidate Pulsar Selection – What next?” @ International Astronomical Union Symposium (IAU) 337, University of Manchester.

2018

“Imbalanced Learning in Astronomy” @ EWASS conference.

“Time-domain Machine Learning – Opportunities and Challenges for the SKA” @ Third ASTERICS-OBELICS Workshop: New paths in data analysis and open data provision in Astronomy and Astroparticle Physics, Cambridge University.

“Time-domain Machine Learning – Opportunities and Challenges for the SKA” @ AI at SKA and CERN, Alan Turing Institute.

“Data processing with the SKA - Machine learning at scale” @ Physics Seminar, University of Southampton.

2019

“Machine Learning – how does it relate to Radiotherapy” @ Radiotherapy Machine Learning Network workshop, Manchester University.

2020

“The Radiotherapy Machine Learning Network” @ Interdisciplinary workshop on Head and Neck Cancer Lancaster University.

REFEREES

On Request.

LINKS

PURE:// [Dr. Robert Lyon](#)
Github:// [scienceguyrob](#)
Twitter:// [@scienceguyrob](#)

SELECTED PUBLICATIONS

- 2022 “Development and optimisation of a machine-learning prediction model for acute desquamation following breast radiotherapy in the multi-centre REQUITE cohort”, *Advances in Radiation Oncology*, vol.7, Issue 3.
- 2021 “A Data Science Approach for Predicting Patient’s Susceptibility to Acute Side Effects in Breast Cancer Radiation Therapy”, *Computers in Biology and Medicine*, vol.135, doi:10.1016/j.combiomed.2021.104624.
- 2021 “MeerCRAB - MeerLICHT Classification of Real and Bogus transients using deep learning”, *Experimental Astronomy*, vol. 51, doi:10.1007/s10686-021-09757-1.
- 2020 “Data Augmentation in a Hierarchical-Based Classification scheme for Variable Stars”, *Third Workshop on Machine Learning and the Physical Sciences, NeurIPS 2020, Machine Learning and the Physical Sciences workshop*.
- 2020 “Classification of Optical Transients at the MeerLICHT Telescope using Deep Learning”, *Third Workshop on Machine Learning and the Physical Sciences, NeurIPS 2020, Machine Learning and the Physical Sciences workshop*.
- 2020 “Imbalance learning for variable star classification”, *MNRAS*, vol.493, Issue 4, doi:10.1093/mnras/staa642.
- 2019 “Comparing Multi-class, Binary and Hierarchical Machine Learning Classification schemes for variable stars”, *MNRAS*, vol.488, Issue 4, doi:10.1093/mnras/stz1999.
- 2019 “A Big Data Pipeline for High Volume Scientific Data Streams”, *Astronomy & Computing* vol.28, doi:10.1016/j.ascom.2019.100291.
- 2018 “Single-pulse classifier for the LOFAR Tied-Array All-sky Survey”, *MNRAS*, vol.480, Issue 3, doi:10.1093/mnras/sty2072.
- 2018 “Imbalanced Learning In Astronomy”, *EWASS*, April 4-6.
- 2017 “Ensemble candidate classification for the LOTAAS pulsar survey”, *MNRAS*, vol.474, Issue 4, doi:10.1093/mnras/stx3047.
- 2017 “Pulsar Searches with the SKA”, *Proc. IAU Symposium No. 337*.
- 2017 “50 Years of Candidate Pulsar Selection – What next?”, *Proc. IAU Symposium No. 337*.
- 2016 “Why are pulsars so hard to find?”, *University of Manchester*.
- 2016 “Fifty Years of Pulsar Candidate Selection: From simple filters to a new principled real-time classification approach”, *MNRAS*, 459 (1): 1104-1123, doi:10.1093/mnras/stw656.
- 2014 “Hellinger Distance Trees for Imbalanced Data Streams”, *ICPR*, pp.1969-1974, doi:10.1109/ICPR.2014.344.
- 2013 “Classification in Imbalanced and Partially-Labelled Data Streams”, in *Simple and Effective Machine Learning for Big Data*, Special Session, IEEE International Conference on Systems, Man, and Cybernetics, doi:10.1109/SMC.2013.260.

ADDITIONAL

- Elected Fellow of the Royal Astronomical Society (FRAS), Professional member of the British Computer Society (BCS).
- Reviewer for the Genetic and Evolutionary Computation Conference, Astronomy & Astrophysics, and MNRAS.
- Two successful PhD. student completions.