

Tarek Allam Jr.

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EDUCATION



Ph.D Applied Machine Learning [Astrophysics]

09.2017 - present

UCL, Centre for Doctoral Training in Data Intensive Science

Supervised by: Prof. Jason McEwen (Primary Advisor), Prof. Ofer Lahav, Prof. Denise Gorse

Thesis: Efficient Deep Learning for Real-time Classification of Astronomical Transients



MSc Computer Science (72%)

09.2014 - 09.2016

UCL, Department of Computer Science, Engineering

Supervised by: Prof. Jason McEwen, Prof. Denise Gorse

Project: Radio Interferometric Image Reconstruction for the SKA: A Deep Learning Approach



MSci Astrophysics Upper Second Class Honours Masters Degree (2:1)

09.2007 - 07.2011

Royal Holloway, University of London, Department of Physics

Supervised by: Prof. Stuart Boogert

Project: Analytical Methods of Stellar Spectra: Stellar Spectroscopy

SELECTED TECHNICAL EMPLOYMENT & EXPERIENCE

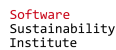


Machine Learning Researcher [TIN Internship]

05.2021 - 11.2021

The Alan Turing Institute, London.

Conduct research into unsupervised probabilistic machine learning and scalable non-parametric inference techniques for sequential latent factor modelling.



Research Software Engineering Fellow

01.2020 - present

Software Sustainability Institute (SSI), London

Advocating for software engineering best practises in the research community by providing version control and testing training to academics. My SSI mission is prepare and up-skill academics for working with large scientific research code-bases, that can scale to many contributors.



Machine Learning Researcher

09.2017 - 09.2022

Centre for Doctoral Training in Data Intensive Science & Industry, UCL, London.

Member of the first cohort. Developed novel architectures for time-series classification. Deployment of models into live production environments for high-throughput real-time classification of astronomical alerts. Featured on numerous collaborative works including Kaggle competition PLAsTiCC dataset.



Research Software Engineer [Ph.D Internship]

08.2019 - 03.2020

The Alan Turing Institute, London.

Working in collaboration with the National Air Traffic Service (NATS), reinforcement learning (RL) was used to investigate machine learning methods to support air traffic controllers. Development of a RESTFUL API using flask was completed to allow for integration of both open-source and proprietary simulators. This has been followed by development of RL agents using OpenAI gym.



Graduate Teaching Assistant

09.2020 - 09.2021

UCL, London. University of Jordan, Amman

Assisting with grading and lesson planning for SPCE038: Machine Learning with Big Data. Lead the migration of TensorFlow 1.x to TensorFlow 2.x. Coordinated infrastructure setup for delivery of course through JupyterBook.

**Graduate Teaching Assistant****03.2020 - 06.2020***London Business School, London.*

Assisting with grading and support for: E517: Python for Finance, QDE-APP: Applied Python Programming and CA22: Basic Python.

**Data Scientist [Ph.D Internship]****01.2018 - 04.2018***Transport for London (TfL), London.*

Working in a team of 4 fellow PhD students, we investigated a variety of machine learning methods for train failure predication, that would be robust to highly imbalanced time-series data. With high cost implications for false-positives, we looked at algorithmic trade-offs that optimised accuracy at a low false positive rate. This work was co-supervised by academics at UCL and data scientists at TfL.

**Research Software Engineer****01.2018 - 04.2018***ATOS, Paris.*

Won 3rd Place in ATOS International IT Challenge, 2015. Working in a team of 5, we represented the UK entry into the ATOS International Challenge. Participating students were asked to uncover the opportunities enabled by the Third Digital Revolution

**Research Software Engineer [Undergraduate Internship]****08.2019 - 03.2020***John Adams Institute for Accelerator Science, London.*

3-dimensional modelling of TM & TE modes of cylindrical accelerator cavities with python embedded in paraview.

CONFERENCES & TALKS

- **FINK Collaboration Workshop, 2022**
Talk: *"Time-series Transformers in Fink"*
- **Statistical Challenges in Modern Astronomy VII, 2021**
Poster: *"Paying Attention to Astronomical Transients: Photometric Classification with the Time-Series Transformer"*
- **International Biomedical and Astronomical Signal Processing (BASP) Frontiers, 2019**
Poster: *"Optimising the LSST Observing Strategy for Supernova Light Curve Classification with Machine Learning"*

AWARDS

- **UCL Nomination for 2022 Schmidt Science Fellowship Application**
Proposal: *"Efficient Learned Image Reconstruction and Compression Algorithms for Real-time Medical Image Analysis"*
- **Software Sustainability Institute Fellowship, 2020: £3,000**
- **Won Honorarium, LSST Cadence Hackathon, 2018: \$1,500**
- **STFC Studentship Centre for Doctoral Training in Data Intensive Science, UCL, 2017**
- **Young Graduate Trainee, Scientific Data Processing, European Space Agency, 2017 (declined)**
- **3rd Place in ATOS International IT Challenge, 2015**
- **UCL Graduate Scholarship, MSc Computer Science 2014: £20,000**

PUBLICATIONS

- [1] C. S. Alves, H. V. Peiris, M. Lochner, *et al.*, "Considerations for optimizing the photometric classification of supernovae from the rubin observatory," *The Astrophysical Journal Supplement Series*, vol. 258, no. 2, p. 23, 2022.
- [2] **Allam Jr, Tarek** and J. D. McEwen, "Paying attention to astronomical transients: Photometric classification with the time-series transformer," *arXiv preprint arXiv:2105.06178*, 2021.
- [3] A. Möller, J. Peloton, E. E. Ishida, *et al.*, "Fink, a new generation of broker for the lsst community," *Monthly Notices of the Royal Astronomical Society*, vol. 501, no. 3, pp. 3272–3288, 2021.

- [4] K. Ponder, R. Hlozek, A. **Allam**, T. Bahmanyar, *et al.*, “The photometric lsst astronomical time series classification challenge (plasticc): Final results,” *AAS*, pp. 203–15, 2020.
- [5] **Allam Jr**, **Tarek**, R. Biswas, R. Hlozek, *et al.*, “Optimising the lsst observing strategy for supernova light curve classification with machine learning,” 2019.
- [6] R. Hlozek, R. Kessler, **Allam**, **Tarek**, *et al.*, “The photometric lsst astronomical time series classification challenge (plasticc),” *AAS*, vol. 233, pp. 212–01, 2019.
- [7] A. Malz, R. Hložek, **Allam Jr**, **Tarek**, *et al.*, “The photometric lsst astronomical time-series classification challenge plasticc: Selection of a performance metric for classification probabilities balancing diverse science goals,” *The Astrophysical Journal*, vol. 158, no. 5, p. 171, 2019.
- [8] **Allam Jr**, **Tarek**, A. Bahmanyar, R. Biswas, *et al.*, “The photometric lsst astronomical time-series classification challenge (plasticc): Data set,” *arXiv preprint arXiv:1810.00001*, 2018.
- [9] M. Lochner, D. M. Scolnic, H. Awan, *et al.*, “Optimizing the lsst observing strategy for dark energy science: Desc recommendations for the wide-fast-deep survey,” *arXiv preprint arXiv:1812.00515*, 2018.
- [10] D. M. Scolnic, M. Lochner, P. Gris, *et al.*, “Optimizing the lsst observing strategy for dark energy science: Desc recommendations for the deep drilling fields and other special programs,” *arXiv preprint arXiv:1812.00516*, 2018.
- [11] T. Allam Jr, “Radio interferometric image reconstruction for the ska: A deep learning approach,” M.S. thesis, University College London, 2016.