Matthew Lyon

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I am currently a PhD student in the Machine Learning group at the University of Manchester. My research focuses on improving MRI data through deep learning, and incorporating geometric priors into deep learning models. I have prior experience working as a research software engineer at several research institutes.

Education

2020 – 2024
United Kingdom
PhD in Computer Science, *University of Manchester*

2015 – 2016
Australia
Master of Medical Physics, *University of Sydney*

2011 – 2014
United Kingdom
BSc (Hons) in Physics, *University of Warwick*

Professional Experience

06/2022 – 04/2023
Stockport, UK
Scientific Consultant, *ACCS*
Part Time 0.3 FTE
- Developed SQL database backend and frontend UI
- Performed statistical analyses
- Authored literature review for AI age assurance Ofcom report

08/2019 – 08/2020
Sydney, Australia
Research Software Engineer, *Save Sight Institute*
Part Time 0.8 FTE
- Developed, tested, and documented neuroimaging processing pipelines.
- Lead algorithm design and optimisation workflows.
- Consulted on neuroimaging analysis techniques and signal processing.

08/2019 – 01/2020
Sydney, Australia
Neuroimaging Analyst, *Sydney Neuroimaging Research Centre*
Part Time 0.4 FTE
- *Developed and implemented neuroimaging analysis pipelines.*
- Performed QC on MRI analysis.

07/2017 – 07/2019
Sydney, Australia
Research Software Engineer, *Heart Research Institute*
Full Time
- Built and managed a distributed computing cluster.
- Developed, tested, and documented neuroimaging processing pipelines.
- Oversaw data ingestion and QC/QA, created dashboard visualisations.
- Conducted clinical research using MRI data.

Technologies

Python • TensorFlow • Keras • PyTorch • NumPy • TypeScript • React • Express • GraphQL

SQLite • MongoDB • C++ • Matlab • Bash • Docker • Ubuntu • OSX • Windows

Publications

2023 **Spatio-Angular Convolutions for Super-resolution in Diffusion MRI,** *NeurIPS 2023*
Matthew Lyon, Paul Armitage, Mauricio A Álvarez

2022 **Angular Super-Resolution in Diffusion MRI with a 3D Recurrent Convolutional Autoencoder,** *MIDL 2022*
Matthew Lyon, Paul Armitage, Mauricio A. Álvarez

2019 **Gender-specific structural abnormalities in major depressive disorder revealed by fixel-based analysis,** *NeuroImage: Clinical*
Matthew Lyon, Thomas Welton, Adrina Varda, Jerome J. Maller, Kathryn Broadhouse, Mayuresh S. Korgaonkar, Stephen H. Koslow, Leanne M. Williams, Evian Gordon, A. John Rush, Stuart M. Grieve

2019 **Is occipital bending a structural biomarker of risk for depression and sensitivity to treatment?,** *Journal of Clinical Neuroscience*
Karen Fullard, Jerome J. Maller, Thomas Welton, Matthew Lyon, Evian Gordon, Stephen H. Koslow, Stuart M. Grieve

2019 **Profound and reproducible patterns of reduced regional gray matter characterize major depressive disorder,** *Translational Psychiatry*
Sarah C. Hellewell, Thomas Welton, Jerome J. Maller, Matthew Lyon, Mayuresh S. Korgaonkar, Stephen H. Koslow, Leanne M. Williams, John A. Rush, Evian Gordon, Stuart M. Grieve

2019 **Structural core of the executive control network: A high angular resolution diffusion MRI study,** *Human Brain Mapping*
Kai-kai Shen, Thomas Welton, Matthew Lyon, Andrew N. McCorkindale, Greg T. Sutherland, Samantha Burnham, Jurgen Fripp, Ralph Martins, Stuart M. Grieve

Talks

New Orleans, USA **Conference on Neural Information Processing Systems,** *NeurIPS 2023*
Spatio-Angular Convolutions for Super-resolution in Diffusion MRI

Zurich, Switzerland **Medical Imaging with Deep Learning,** *MIDL 2022*
Angular Super-Resolution in Diffusion MRI with a 3D Recurrent Convolutional Autoencoder

Manchester, United Kingdom **Advances in Data Science and AI Conference,** *ASDAI 2022*
Angular Super-Resolution in Diffusion MRI with a 3D Recurrent Convolutional Autoencoder

Invited Reviewer

Hawai'i, USA **International Conference on Machine Learning,** *ICML 2023*

Valencia, Spain **International Conference on Artificial Intelligence and Statistics,** *AISTATS 2022*

New Orleans, USA **Conference on Neural Information Processing Systems,** *NeurIPS 2022*