

Rosco Hunter

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PhD candidate at the University of Warwick, focusing on Automated Machine Learning (AutoML), supervised by Dr Hongkai Wen. Research interests include the principles behind human and artificial intelligence (AI), alongside the policy implications of AI. Received a First Class (85%) BSc in Mathematics, achieving a first in all modules taken whilst at Warwick

Education

University of Warwick 2022 - Present
PhD Candidate in Machine Learning

- Joint first author of "Exploiting Network Compressibility and Topology in Zero-Cost NAS", published in the International Conference on Automated Machine Learning, 2023 (26% acceptance rate)
- This paper proposed a set of methods which significantly outperform existing low-latency techniques for automatically identifying high-performance neural network architectures. To predict a network's performance researchers typically define a score to measure parameter-importance and aggregate these scores over all the parameters in the network
- Instead of naively aggregating these scores, our paper proposed assessing their compressibility. Specifically, we calculated the signal to noise ratio of parameter importance over each layer of the neural network. Intuitively, a network is poorly designed if its compressible as its training will be dominated by a small subset of the parameters
- Current research direction focuses on improving the latency of text-to-image diffusion models by eliminating redundancies in their sampling procedure

University of Warwick 2019 - 2022
BSc Mathematics

- First Class Degree (85%), receiving a high first (at least 75%) in all 25 assessed modules taken whilst at Warwick
- Key Taught Modules: Maths of Machine Learning (87%); Topics in Mathematical Biology (81%); Bayesian Statistics (88%); Neural Computing (84%); Applied Dynamical Systems (81%); Advanced Linear Algebra (81%); Measure Theory (88%); Modelling & Numerics (95%); Asymptotics and Integral Transforms (91%); Stochastic Processes (80%)
- Essay: 'Hopfield Networks and Boltzmann Machines' (81%). This explored the convergence properties of these classical neural networks through the lens of statistical mechanics and received a mark amongst the top in my cohort

Newcastle-under-Lyme School 2017 - 2019

- A-level: 4 A*s (Mathematics, Further Mathematics, Physics, Psychology)
- Top 1000 in UKMT Senior Mathematics Challenge (2018)

Endon High School 2012 - 2017

- GCSE: 10 A*s, 2 As (Self-taught in Further Mathematics – receiving an A* with Distinction)

Technical Experience

Research Experience in Neuroscience 2021 - 2023

- Worked under the supervision of Prof. Edmund Rolls of the Oxford Centre of Computational Neuroscience measuring effective connectivity in the human connectome. Connectivity matrices were derived from a 'Hopf Algorithm' composed of noisy coupled oscillators which modelled the 360 cortical regions in the HCP multimodal parcellation atlas
- The Hopf algorithm has since been used to study the connectivity of brain areas ranging from the hippocampus to the anterior cingulate cortex. These areas are important for understanding memory formation and depression, respectively
- Contributions to the explanation and implementation of the Hopf algorithm led to acknowledgments in four papers published in Cerebral Cortex, one paper in Neuroimage, and one paper in Human Brain Mapping

Teaching and Speaking Experience

Mathematics Graduate Teaching Assistant 2022 - 2023

- Responsibilities included marking the mathematics assignments of eight first-year students and conducting small group teaching sessions twice a week to provide feedback on the assignments

Young Leadership Roles and Debating 2015 - 2019

- Sole recipient of my school's award for Outstanding Spoken English – demonstrated through my role as deputy head boy and active participation in classical as well as Model United Nation debates across the UK

Additional Skills

Programming Languages: Python, MATLAB

Interests: Passion for philosophy, world music, and foreign affairs