Rosco Hunter

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PhD candidate in the ML Systems Lab at the University of Warwick. My research interests are in understanding, regulating, and developing intelligent systems that can be harnessed for the benefit of humanity

Research Experience

Research Collaboration with Samsung AI Centre (Cambridge) — 2023 - 2024

- Joint-first authored “Fast Inference Through the Reuse of Attention Maps in Diffusion Models”
  This paper reduces the latency of text-to-image diffusion models by selectively reusing attention maps during the sampling procedure [pdf]
- Joint-first authored “Exploiting Network Compressibility and Topology in Zero-Cost NAS” – Awarded Best Paper
  This paper exploits redundancies in an untrained network’s gradients to predict its performance after training [pdf]

Computational Neuroscience Research — 2021-2023

- Explored and developed computational models of pyramidal cells, sparse distributed memory, and cortical connectivity under the supervision of Prof. Edmund Rolls (Oxford Centre for Computational Neuroscience)
- Improvements to the implementation and explanation of the ‘Hopf connectivity algorithm’ were acknowledged in a notable collection of ‘Effective Connectivity’ papers that have since accrued over 200 citations

Education

University of Warwick — 2019 - Present

PhD Candidate in Machine Learning

- Research project focuses on Automated AI and Efficient Architecture Design
- Supervised by Prof. Hongkai Wen - Advised by Prof. Magnus Richardson and Dr. Long Tran-Thanh

BSc Mathematics

- First Class Degree (85.0%) receiving a first in all 25 assessed modules (~top 5% of cohort)
- Key Modules: Mathematics of Machine Learning; Mathematical Biology; Neural Computing; Modelling & Numerics; Bayesian Statistics; Applied Dynamical Systems; Bifurcations & Symmetries; Advanced Linear Algebra

Secondary Education — 2012 - 2019

- A-levels: 4 A*s in Mathematics, Further Mathematics, Physics, Psychology (~top 1% of the UK)
- GCSEs: 10 A*s (~top 1% of the UK)

Teaching and Speaking

Graduate Teaching Assistant and Tutor — 2019 - 2024

- Delivered support classes and assessed over 150 students for MA3K1 - *Maths of Machine Learning* [Warwick] - covering linear programming, universal approximation, statistic learning theory, Markov decision process, and more
- Provided over 500 hours of teaching to help students tackle mathematics and physics content for their GCSEs, A-levels, Olympiads, Oxbridge interviews, and first-year university courses

Speaker at AutoML — 2023

- Delivered the "Best Paper Talk” at the International Conference of Automated Machine Learning (AutoML 2023)

Current Projects

Research Collaboration with Abacus.AI

- Improving the efficacy and efficiency of large language models at complex numerical tasks

Independent Projects in AI Policy and Existential Risk

- AI Policy: Exploring a notion of ‘conversational access’ - a specific form of structured access in which users are restricted to interact with an LLM’s source code through natural language conversations alone (Draft pdf)
- Existential Risk: Modeling the impact of technological progress on state power as a pitchfork bifurcation (Draft pdf)