Harry Langford

hjelangford@gmail.com +447434 822724 hjel.me

Education

University of Oxford **2024 – 2025**

- MSc in Advanced Computer Science

University of Cambridge **2021 – 2024**

- Graduated with **distinction**, ranked **5th** out of 113 students
- Highly Commended final year Dissertation
- First class in first, second and third year, ranked 18th, 5th and 5th

The Royal Grammar School, High Wycombe **2014 – 2021**

- 4 A*s in Maths, Further Maths, Physics and Computer Science at A Level

Employment

Research Intern, Cambridge Computer Lab **12 weeks, Summer 2024**

- Compared the effectiveness of ML backdoors to adversarial examples under different threat models. Worked with both vision and text models. This work is being written up for publication.
- Profiled LLM inference to evaluate whether batching and compressing similar queries at the input level could lead to higher throughput.

Research Intern, Cambridge Computer Lab **12 weeks, Summer 2023**

- Investigated weight-invariant backdoors embedded in the computation graph of neural networks. Automated their construction and overcame the limitations of previous methods. The resulting paper was accepted into S&P: the top security conference.
- Discovered and implemented a novel method of locking neural networks to specific hardware. This method degrades the model performance to near-random guessing when they are pruned or quantised. This work was incorporated into a paper which has been accepted at SaTML.

Projects

- **Uncertainty estimation for spiking neural networks**
  The resulting dissertation was **highly commended**. Generalised uncertainty estimation methods to spiking neural networks, evaluating theoretical correctness, and empirical correctness on downstream tasks with neuromorphic data. Over 12000 lines of code.
- **Sequence classifier expressivity**
  Compared the theoretical expressivity to the empirical expressivity for sequence classification models. Resulting work was commended by a Cambridge lecturer.
- **Generalising graph positional encodings to edges**
  Generalised graph positional encodings to edges. Proved theoretical expressivity benefits. Empirically evaluated the effect on performance.

Skills

- **Programming** Written over 30,000 lines of Python code. Completed projects and coursework in C++, Java and OCaml.
- **Machine Learning** Substantial experience working with machine learning systems.
- **Linux** Using Linux for 2 years. Experience with development on GPU servers and HPC.

Accomplishments

- Churchill College Prize Scholarship: 2022, 2023, 2024
- Jon Rabone prize for 'the most meritorious performance for an undergraduate in Churchill College in the Computer Science Tripos Exams': 2022, 2023
- 3rd group in Hack Cambridge 2022 out of 107 participants