

Luca Lowndes

Passionate about machine learning, distributed computing, and road bike riding.

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ABOUT ME

Youngest-ever UniHack winner and Monash representative at the 8th APAC AI-HPC Competition. Passionate about AI, HPC, and distributed intelligence with hands-on experience in PyTorch, NCA, and large-scale optimisation

EXPERIENCE

- **Monash eResearch** Melbourne, VIC
 - *Representing Monash Internationally at the 8th APAC AI-HPC Competition* Mar. 2025 - Sep. 2025
 - **About The Competition:** The National Computational Infrastructure (NCI), in collaboration with HPC-AI Advisory Council and the National Supercomputing Centre (NSCC) Singapore, hosts the Asia-Pacific High-Performance Computing and Artificial Intelligence (APAC HPC-AI) Competition.
 - **Our Tasks:** I have been selected, representing Monash University, to compete in the 2025 competition. This year we will focus on optimising the open source Fortran chemistry tool NWChem, as well as optimising DeepSeek's reinforcement learning.
 - **My Role:** I have taken up a leadership position within the team, working across both tasks, where my main role has been to focus on creating strategies for optimisation that are novel, to distinguish ourselves within the competition.
 - **What I learnt:** During this competition I have become confident in a wide range of cluster management tools, utilising both PBS Pro and Slurm extensively on a range of clusters from the NSCC, NCI, and Firmus.
- **Monash DeepNeuron** Melbourne, VIC
 - *AI, Outreach & HPC Technical Team Member* Feb. 2025 - Present
 - **Neural Cellular Automata (NCA):** Implement cutting-edge NCA methodologies from research papers using PyTorch to model self-organizing systems, such as embryo development.
 - **System Optimisation:** Research and develop novel on-device and cost-function optimizations for NCA models, leveraging WebGL and various APIs.
 - **Education & Outreach:** Educate students on the fundamental principles of AI and demonstrate how they can leverage AI tools to enhance their learning and research.
- **Freelance Software Engineer** Hybrid
 - *Enhancing User Experiences with AI Integration* Jan. 2025 - Present
 - **Scag Australia:** Designed and built the "Scag Mechanic" AI agent for model comparison, troubleshooting, and service recommendations. Structured proprietary data and integrated the AI into web channels with a defined brand persona and legal safeguards.
 - **International Mowers:** Developed the "IM Advisor" AI assistant to help users select mowers and compare models. Unified global product data and prototyped an embeddable chat widget for web and mobile platforms while enforcing brand identity.
- **Domino's** Brighton, VIC
 - *Day Manager* Dec. 2023 - Jul. 2025
 - **Operations Management:** Managed daily deliveries, operations and staff in a fast paced environment.

PROJECTS

- **UniHack 2025 - Growth Garden:** Achieved first place out of 850+ participants, becoming the youngest ever winner. Created Growth Garden, a tool to simplify personal development and life improvement.
- **MNIST Interactive Model Analyzer:** Developed an interactive tool for experimenting with MNIST handwriting recognition models using a custom-built 28x28 drawing grid interface. Uses Tkinter for visualisation and compatible with Pytorch and Tensorflow

EDUCATION

- **Monash University** Melbourne, VIC
Bachelor of Engineering & Computer Science - High Distinction WAM *Feb. 2025 – Dec. 2029*
- **Elwood College** Elwood, VIC
VCE Certificate - Dux of Mathematical Methods *Graduated 2024*
- **Certifications & Coursework**
Andrew Ng. Machine Learning Specialisation, Deep Learning Specialisation, CS50x, Certificate III in IT

VOLUNTEERING

- Monash DeepNeuron: Ran a series of workshops at high schools educating students on effective uses of Generative AI, and how deep learning models work.