Andrew M. **Webb**

MACHINE LEARNING RESEARCH SCIENTIST / ENGINEER

☐ +44 7903 202284 | ✉ andrew@awebb.info | ⌂ awebb.info | ⌂ github.com/grey-area

Produced 17/11/2025 — up-to-date CV at www.awebb.info/cv

Experience

Senior Machine Learning Research Scientist
2024–Present

GENIE AI, LONDON

Built LLM-based agentic systems for the legal domain. Built and validated evaluation pipelines to measure performance and enable iterative improvement. Engaged with external domain experts to understand customer needs. Demonstrated a product mindset; proactively identified and implemented improvements that measurably increased conversions from free- to paid-tier customers.

Lead Machine Learning Research and Development Engineer
2019–2024

vTIME LIMITED, LIVERPOOL

Grew and led a team developing novel machine learning solutions—built from scratch or based on foundation models—for problems with vision, audio, text, and 3D scene data. Developed processes for reducing development time and improving reproducibility. Deployed models on mobile devices. Managed scalable, streaming cloud deployments. Managed CI/CD pipelines. Example projects: text-to-speech (transformer based), avatar customization, emotion/animation prediction. Produced tools used internally in development of products. Contributed to strategic direction by proposing technologies, features, and products. Responsible for stakeholder engagement/presentations. Travelled and presented at conferences.

Postdoctoral Research Associate, LAMBDA/PAMELA Projects
2017–2019

SCHOOL OF COMPUTER SCIENCE, UNIVERSITY OF MANCHESTER

Studied methods for encouraging diversity in ensembles in deep learning (arxiv.org/abs/1902.04422 and github.com/grey-area/modular-loss-experiments), while minimizing communication overheads when training in a distributed setting. Studied bias and variance in ensemble methods. Presented at the Arm Research Summit 2018. Integrated object detection into SLAM (simultaneous localization and mapping) systems, studying energy/accuracy trade-offs. Attended data study group at the Alan Turing Institute, working with NATS—the UK's main air navigation service provider—to predict aircraft trajectories. Developed a prototype. Proposed a method that reduced time taken to join flight and weather data from hours to minutes.

Research Software Engineer, SpiNNaker Project
2012, 2016

SCHOOL OF COMPUTER SCIENCE, UNIVERSITY OF MANCHESTER

Developed graphics rendering software for the SpiNNaker neuromorphic computing platform. Presented to visitors from Samsung. Wrote code for generating neural data structures for SpiNNaker—a many-core neuromorphic (spiking neural network) computing platform—in parallel on the machine itself, decreasing load times and energy use by an order of magnitude. (github.com/project-rig/pynn_spinnaker).

Education

PhD in Computer Science, Machine Learning and Optimization Group
2012–2016

SCHOOL OF COMPUTER SCIENCE, UNIVERSITY OF MANCHESTER

Research synopsis: Evolutionary algorithms are a family of heuristics for solving optimization problems. Solutions can differ in their 'evolvability'—their propensity to give rise to good descendant solutions. I use sequential Bayesian filtering algorithms to estimate the evolvability of each solution in the population, in order to select evolvable solutions. Theoretical and experimental results show that periodically selecting solutions based on evolvability estimates can lead to increased expected performance on some optimization problems. (Thesis: awebb.info/misc/thesis.pdf). During the PhD I attended master's degree level course units on machine learning and data dimensionality reduction, and also undergraduate course units in the mathematics department.

BSc in Artificial Intelligence, First Class Honours (80%)
2006–2010

UNIVERSITY OF MANCHESTER

- Studied course units such as *Computer Vision*, *Symbolic AI*, and *Machine Learning and Optimization*.
- As a final year project, produced software that translates descriptions of programs into sets of 2D tile shapes, where tiling the plane with those shapes is analogous to running the program. (Report: awebb.info/misc/ug_report.pdf).

Skills

Programming
- Languages, ordered by proficiency: Python, Scala, C++, C
- ML libraries: PyTorch, LangChain/LangGraph, Hugging Face, Scikit-learn
- Other libraries: NumPy, Matplotlib, SciPy

LLMs
- LangChain/LangGraph
- Building agentic systems
- Building evaluation frameworks
- RAG
- Fine tuning

Machine Learning/Inference/Probability
- PyTorch and exporting to portable formats, e.g., TorchScript, ONNX
- Transformers, normalizing flows, diffusion models, GANs
- Bayesian statistics, probabilistic programming languages Stan and PyMC
- Metaheuristic optimization algorithms, e.g., evolutionary algorithms
- SLAM (simultaneous localization and mapping) algorithms
- Spiking neural networks and neuromorphic hardware

Cloud Computing / AWS
- Deployed scalable, low-latency models on AWS with Lambda, EC2 auto-scaling spot fleets, and ECS
- Experience with other AWS services: S3, ECR, SQS, API Gateway

Other Computing Skills
- Docker, Docker Compose
- CI/CD; GitHub Actions, GitLab CI/CD
- Bash
- Git
- Wrote QCircuits, a Python library for simulating quantum computers (awebb.info/qcircuits/index.html)

Communication/Management/Other Skills
- Managing a team
- Regular presentations to stakeholders
- Strong mathematical background
- Presented at international conferences, e.g., ALIFE, ECAL, the Arm Research Summit, Develop
- Co-chaired a regular research seminar
- One-to-one teaching and marking on *Mathematical Techniques for CS*, *Computer Graphics*, and *Symbolic AI* course units

Publications

- D. Wood, T. Mu et al.: *A Unified Theory of Diversity in Ensemble Learning*, JMLR 2023
- C. Shand, R. Allmendinger et al.: *Evolving Controllably Difficult Datasets for Clustering*, **best paper nomination** GECCO 2019
- A. M. Webb, G. Brown, and M. Luján: *ORB-SLAM-CNN: Lessons in Adding Semantic Map Construction …* TAROS 2019
- A. M. Webb, C. Reynolds et al.: *Joint Training of Neural Network Ensembles*, preprint arXiv:1902.04422 2019
- S. Saeedi, B. Bodin et al.: *Navigating the Landscape for Real-Time Localization and Mapping…*, Proc. IEEE Vol. 2018
- A. M. Webb: *On Selection for Evolvability*, PhD thesis 2016
- A. M. Webb, J. Handl, and J. Knowles: *How Much Should You Select for Evolvability?*, ECAL 2015
- A. M. Webb and J. Knowles: *Studying the Evolvability of Self-Encoding Genotype-Phenotype Maps*, ALIFE 2014
- A. M. Webb, S. Davies, D. Lester: *Spiking Neural PID Controllers*, ICONIP 2011

Interests

Hobbies and interests include indoor climbing, football, science fiction, and board games. I use my Twitter account as a platform for sharing animations and visualizations about maths and science.