

MATTHEW ZHANG

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EDUCATION

University of Cambridge

Cambridge, UK

BA & MEng Engineering (Distinction & First Class Honours)

October 2021 – June 2025

- Specialized in Information and Computer Engineering with a research focus on Bayesian ML.
- Consistently ranked in the top 5% of the cohort; awarded the Clough Scholarship annually for academic excellence.
- **Key Modules:** Deep Learning & Structured Data; Probabilistic Machine Learning; Computational Statistics & Machine Learning; Computer Systems & Concurrency.

PUBLICATION

Graph Random Features for Scalable Gaussian Processes

Accepted at NeurIPS 2025 Workshop on Structured Probabilistic Inference & Generative Modeling.

Matthew Zhang, Jihao Andreas Lin, Adrian Weller, Rich Turner, Isaac Reid

TL;DR: We enable graph Gaussian process inference in $\mathcal{O}(N^{3/2})$ time using graph random features (GRFs), making Bayesian optimization feasible on million-node graphs on a single computer chip.

<https://arxiv.org/abs/2509.03691>

WORK EXPERIENCE

Machine Learning Group, University of Cambridge

Cambridge, UK

Researcher

October 2024 – Present

- Designed a scalable inference algorithm for GPs on graphs, reducing complexity from $\mathcal{O}(N^3)$ to $\mathcal{O}(N)$ and enabling inference on networks with 10M+ nodes.
- Integrated sparse linear algebra and randomized feature maps into the GP framework, achieving over 100× speedups versus standard implementations.
- Drafted a first-author manuscript for submission to ICLR.
- **Research Areas:** Bayesian inference, graph machine learning, Monte Carlo methods.
- **Tech Stack:** Python, PyTorch, CUDA, GPytorch, GPflow, NetworkX, SciPy, NumPy, MATLAB.

Microsoft

Cheltenham, UK

Software Engineering Intern

July – September 2024

- Researched and deployed a scalable graph ML algorithm for threat detection, processing data from 30M+ Azure cloud apps daily.
- Developed distributed ML pipelines using Azure ML to accelerate large-scale data processing.
- Implemented new threat indicator services in .NET/C#, with comprehensive unit tests to ensure robustness and reduce integration errors.
- **Tech Stack:** C#, .NET, KQL, PySpark, PyTorch, Pandas, GraphSAGE.

Playfair Technologies

Remote

Machine Learning Engineer

Nov 2022 – May 2023

- Built end-to-end LLM/NLP pipelines for financial sentiment and industry classification; fine-tuned Hugging Face Transformers with long-context segmentation, improving accuracy by 20%+.
- Designed a multi-stage classification pipeline (segmentation → entity/ticker extraction → zero-shot industry labeling) delivering robust outputs with ~50% lower inference cost.
- Expanded datasets by 30× through augmentation (selective search, image transforms, noise injection) to enhance model robustness and generalization.
- **Tech Stack:** Transformer-based LLMs (GPT-3, DistilRoBERTa), CNN/RNN, OpenCV, PyTorch.

Huawei

Cambridge, UK

CPU Architecture / Software Engineering Intern

June – September 2022

- Designed and implemented an auto-generation system for machine-readable ISA specifications by creating a parser to extract code snippets for a novel ISA semantics language, [Sail](#).
- Deployed and managed a Kubernetes cluster to run containerized applications and streamline CI/CD pipelines.
- **Tech Stack:** Python, Kubernetes, Docker, Jenkins, CI/CD, ISA, Linux, Git.

SELECTED PROJECTS & HACKATHONS

Cambridge GenAI Hackathon

- Developed a scalable SaaS platform leveraging multi-agent LLM frameworks; awarded 1st place out of 50+ teams.
- **Tech Stack:** Multi-agent LLMs, AutoGen, HTML, JavaScript, CSS.

RISC-V Processor Optimization

- Optimized an RV32I processor on FPGA, achieved a 13.3% increase in maximum clock frequency.
- **Tech Stack:** C/C++, FPGA, RISC-V Architecture, SIMD, Branch Prediction.

Hack Cambridge 2023

- Created a prototype to accelerate manga production by fine-tuning Stable Diffusion with the Manga101 dataset; placed 3rd out of 80+ teams.
- **Tech Stack:** Stable Diffusion, ControlNet.