

Ryan Xie

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Education

The University of Melbourne

2026–Present

Master of Science (Mathematics and Statistics) – Statistics and Stochastic Processes specialisation

Current coursework: Advanced Probability, Bayesian Statistical Learning, Mathematics of Risk.

The University of Melbourne

Feb 2022–Jul 2026

Bachelor of Science (Electrical Engineering Systems)

WAM: 84.7/100 (H1)

Concurrent Diploma in Mathematical Sciences (Statistics)

WAM: 80.1/100 (H1)

Selected results: Intermediate Microeconomics (95), Economics of Financial Markets (93), Stochastic Modelling (93).

Exchange semester: TU Delft Electrical Engineering (2025) – 9.0/10 overall.

Awards: IEEE Victorian Section Award for Best EE Pathway Student (2024); David Silver Award (2023).

Experience

Melbourne University Racing (Formula SAE)

Jan 2024–Present

Lead Electronics Engineer; previously Low Voltage Engineer / Melbourne, Australia

- Lead a 17-person hardware, software and data team delivering electronics for the 2026 car, spearheading the full low-voltage redesign from commercial MoTeC ECUs to custom STM32 DAQ and control boards.
- Architected a unified C/FreeRTOS firmware platform across five distributed STM32 boards, using a data-driven BSP and target-selectable CMake build system to decouple application logic from board hardware.
- Designed the 2024 power distribution module (RP2040 C/C++) and modelled battery/inverter thermal performance using internal-resistance losses.
- Integrated PartsBox inventory data into an internal platform supporting purchasing, kitting and PCB lifecycle tracking, hosted on Azure Container Apps with a SQL database and automated CI/CD.

Affinda

Jan–Oct 2026

AI Engineer; previously Summer Intern (Platform) / Melbourne, Australia

- Engineered a sales knowledge system that ingests and indexes past calls and emails to surface account context, and contributed to a company-wide agent-skills repository and unified multi-provider LiteLLM gateway.
- Instrumented internal AI-usage telemetry using OpenTelemetry and Elastic; analysed adoption patterns to streamline power-user seat upgrades and identify enablement gaps.
- Architected and shipped an agentic client-solution design and onboarding workflow from scoping to release during a six-week platform internship, targeting financial-sector clients.

Formula Student Team Delft

Feb–Jul 2025

Electronics Engineer / Delft, Netherlands

- Designed and validated a 300 W, 50 V-to-24 V (12.5 A) DC/DC converter and brought up analog safety, power-distribution, STM32 DAQ/driver-interface and BMS boards.
- Wrote and executed board-level test plans, isolated and repaired PCB faults across testing and competition; DUT25 placed 3rd overall at Formula Student Germany.

Research

Constant-Time Online Prediction of Markov Chains with Memory

2026

Undergraduate Science Research Project / Grade: 93/100

- Derived and mathematically proved a closed-form Bayesian online predictor for Markov chains with memory, replacing MCMC estimation.
- Reduced per-observation computation from $O(T)$ for the baseline, which revisited the full observed history, to $O(1)$, where T is the sequence length.
- Implemented simulations and runtime profiling in Python across a range of sequence lengths; measured a **6,000×** speed-up over the MCMC baseline in project benchmarks.

Technical Skills & Projects

Programming: Python (NumPy, pandas, SciPy), C, Embedded C++, SQL, Git, GitHub Actions, CMake, CI/CD

Quantitative: Bayesian inference, stochastic processes, Markov chains, MCMC, simulation, runtime profiling

AI & Data: LLM & agentic workflows, RAG, LiteLLM, OpenTelemetry, Elastic, Azure Container Apps

Hardware & Embedded: Altium Designer (Advanced Certification), mixed-signal & DC/DC PCB design, STM32, RP2040, nRF52840, FreeRTOS, Zephyr, CAN, SPI, I2C, BLE

BLE-Connected Ultra-Low-Power Energy Harvester (2025): Designed a custom ultra-low-power PCB in Altium Designer around the nRF52840, implementing microwatt-scale BLE communication for batteryless sensing.

Fanlabs.net (2023): Built an automated Python benchmarking loop to apply CPU load, log estimated power and capture Arduino intake temperature; automated deployment via GitHub Actions and Cloudflare Workers.

Activities & Interests

MUEEC Digital Media Officer (2022–2023). **Interests:** Skiing, Formula 1, branding and typography design.