RYAN MANCHESTER

Software Engineer | Embedded & Autonomous Systems

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Summary

I'm a Computer Science graduate (100% A/A+ across every graded paper) and current MSc student, with practical experience in embedded C, Python, machine learning, networking, and healthcare. I enjoy hands-on prototyping and debugging the most. With some technical teaching and multidisciplinary research under my belt, I'm looking for stimulating graduate roles around ML and embedded systems.

Experience

Sessional Assistant
University of Waikato | Mar 2024 – Present | Hamilton, New Zealand

- Support labs, coursework, marking, and one-to-one guidance across programming, hardware, networking, cybersecurity, mobile computing, and embedded systems.
- Taught classes of up to 30 students in Data Structures and Algorithms (COMPX201), covering trees, graphs, and hash tables, and helped students learn and debug embedded C/C++ and pointer-based programming in Embedded Systems (COMPX349).
- Guided students through Jetpack Compose, Android best practices, and wearable data integration in Mobile & Wearable Computing (COMPX551).
- Papers supported: Mobile & Wearable Computing (COMPX551), Embedded Systems (COMPX349), Network Security (COMPX316), Software Engineering Design 1 (COMPX241), Systems & Networks (COMPX234), Computer Hardware & Microprocessors (COMPX230), and Data Structures and Algorithms (COMPX201).

Student Ambassador — University of Waikato – HECS Division | Mar 2024 – Present

- Represent Computer Science and HECS programmes at university events, guiding prospective students on study pathways.

Scholarship — Generating Names for Unidentified Patients — University + DHB | Nov 2023 – Feb 2024

- Used Python and Te Reo Māori-informed, Markov-chain naming approaches for generating anonymous pseudonames, refined through regular clinician feedback (Research & Enterprise Study Award 101724).

Projects

Mental Fatigue Detection — Measuring Cognitive Fatigue with Multimodal Wearables
MSc thesis | Python | Multimodal wearables | Current

- Designing a publicly available participant dataset for a within-subject fatigue-induction protocol using the TloadDback multitasking simulation, validated against VAS-F, Stanford Sleepiness Scale, NASA-TLX, and PVT-B reaction-time measures.

Summer Research Scholarship: Analyzing Cognitive Fatigue
Python | Healthcare research | Waikato DHB | Awarded 2024

- Built a Python data-streaming pipeline synchronising multimodal wearable sensors (Muse EEG, Polar ECG, Shimmer EDA/EMG/IMU) across baseline, task, and post-task phases.
- Trained and evaluated SVM, K-NN and Linear Regression tree classifiers for streaming fatigue classification, incorporating causal-data analysis; motivated by safety-critical applications where early fatigue detection could reduce risk.

Image Classification with CNNs, ViTs & Generative AI
MSc Deep Learning (COMPX525) | PyTorch | TensorFlow/Keras | scikit-learn | Stable Diffusion | DINOv2

- Generated a synthetic image dataset with Stable Diffusion XL and LLM-written prompts, extracted DINOv2 (ViT) embeddings, and trained KNN and neural-network classifiers in scikit-learn/Keras, reaching up to 97.8% test accuracy.
- Built and compared a CNN (EfficientNetV2, Keras/TensorFlow) against a Vision Transformer (ViT-B/16, PyTorch/TorchVision) on a messy, real-world 16-class cell-culture image dataset, achieving 69.8% vs 64.4% validation accuracy and analysing the overfitting/convergence trade-offs.

CheckMe – Period Tracker
Flutter | Dart | Android (ViewModel/MVVM) | Privacy-first mobile application

- Reproductive-health Menstrual tracker built with Flutter and an Android View Model (MVVM) architecture, with on-device storage, cycle predictions, and data export, keeping sensitive information under the user's control. Currently turning this into a publicly available app.

Volunteering

Emergency Medical Technician (Volunteer)
Hato Hone St John | Jan 2020 – Present | New Zealand

- Lead a frontline volunteer ambulance crew, mentoring junior clinicians (First Responders) and overseeing patient-care decisions under pressure.
- Hold bi-monthly training sessions for First Responders, alongside frontline patient care.

Education

Master of Science – Computer Science
University of Waikato
In progress, thesis: mental-fatigue detection using sensing workflows, feature engineering, and machine-learning model evaluation. I've Done Machine Learning for Data Streams (A+), Deep Learning (A), Extremely Parallel Programming (A+).

Bachelor of Computer Science
University of Waikato
Conferred 14 October 2025. 100% A/A+ across all 23 graded papers (17 A+, 6 A), including Computer Vision and Advanced Web Development (both A+).

Virscient's ELEVATE Programme
2024
Selective 10-week technical extension programme: embedded C, microcontrollers, peripherals, toolchains, build systems, debugging, Bluetooth/BLE, IEEE 802.11, and professional software engineering practice.

Skills

Languages
Python, C, C++, Java, JavaScript, Bash

Machine Learning
CNNs, Vision Transformers, PyTorch, scikit-learn, pandas, DINOv2

AI Tooling
Claude, agentic AI workflows

Mobile & Web
Flutter & Dart, Android, Jetpack Compose, React, HCI/UX

Systems & Security
Embedded Systems, Linux & Git, Docker & Compose, Networking & Security

Algorithms & Theory
Algorithm Design & Analysis, Data Structures, Discrete Mathematics, Formal Logic

Research & Teaching
Healthcare Research, Teaching & Mentorship

Key achievements

- **Research Masters Scholarship (Round 2) — 2025**
  University of Waikato

Research Masters Scholarship — 2026
University of Waikato, MSc. Research funding.

- **Summer Research Scholarship — 2025**
  University of Waikato funded research placement.
- **Research & Enterprise Study Award (111021) — 2024**
  University of Waikato research funding award.