Robert Spencer

Data Scientist | PhD Researcher in Artificial Intelligence
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Summary

Data Scientist and PhD Researcher building end-to-end AI systems that translate complex data into measurable, real-world outcomes. Currently undertaking a PhD in Artificial Intelligence at The University of Queensland in affiliation with the SAAFE CRC, supported by a fully funded RTP scholarship and SAAFE CRC top-up. My research focuses on cross-sectoral digital twins for antimicrobial resistance (AMR) risk assessment. Previously, as Lead Data Scientist at Radix Nutrition (NZ), I designed and deployed proprietary ML systems that cut formulation iteration time by 90%+ and reduced formulation costs by 25%+. My background spans production ML, time-series forecasting, transfer learning, optimisation, and research translation, including a first-author Q1 publication in *Energy & Buildings* (2025).

Skills

- **Programming:** Python, SQL, R, JavaScript/TypeScript

- **Machine Learning:** PyTorch, scikit-learn, time-series forecasting, transfer learning, transformer models, optimisation

- **Data & Tools:** Pandas, Polars, Docker, Git, data pipelines, dashboards, PyQt

- **Domain Expertise:** Digital twins, synthetic data, federated learning, AMR risk assessment, nutrition optimisation

Experience

The University of Queensland & SAAFE CRC — Brisbane, Australia

PhD Researcher   Apr 2026 — Present
Researching cross-sectoral digital twins for antimicrobial resistance (AMR) risk assessment in agribusiness, food, and environmental systems.

- Undertaking doctoral research in Artificial Intelligence focused on the development of cross-sectoral digital twins for AMR risk assessment.

- Research affiliated with the SAAFE CRC (Solving Antimicrobial Resistance in Agribusiness, Food and Environments Cooperative Research Centre).

- Supported by a fully funded RTP scholarship and SAAFE CRC top-up.

Radix Nutrition — Hamilton, New Zealand

Lead Data Scientist   Jan 2025 — Oct 2025
Led the end-to-end design, development, and deployment of AI-driven solutions, acting as both product owner and individual contributor.

- Built proprietary AI/ML optimisation systems (Python, PyTorch) integrating multiple nutritional databases (NZFCD, AFCD, USDA FoodData Central) and encoding complex FSANZ Food Standards Code logic, cutting formulation iteration time by **90%+** (weeks → days). Presented live demonstrations of this work to Google & Fonterra.

- Led data-driven substantiation for all general level health claims, applying the FSANZ framework to quantify **150+** unique health benefits for a single product line and enabling key marketing positions such as 'World's Healthiest'.

- Co-developed AI-optimised breakfast and smoothie formulations, reducing formulation costs by **25%+** while modelling for compliance across nutrient targets and multiple front-of-pack (FoP) labelling systems, including Nutri-Score, HSR, NPSC, and traffic-light labels.

- Developed in-house tools — dashboards, GUIs, scripts, and ad hoc analyses — adopted by R&D and Operations to accelerate cross-team decision-making.

Data Analyst   Apr 2024 — Jan 2025
Radix's first technical hire, responsible for establishing the company's data and software foundations.

- Bootstrapped company-wide data infrastructure, analytics workflows, and internal web tools supporting R&D and operations.

- Worked hands-on across data analytics, software engineering, web development, and applied nutrition in a high-velocity environment.

Massey University | Research Assistant — Artificial Intelligence   *Sep 2023 — Oct 2024*
Transformers, transfer learning, and time-series forecasting for building energy prediction.

- As first author, led the project end-to-end: co-defined the research direction, conducted experimentation across 16 Building Data Genome 2 datasets, and authored the manuscript for journal submission.

- **Publication:** Spencer et al. (2025), *Energy & Buildings* (Q1). DOI: [10.1016/j.enbuild.2025.115632.](10.1016/j.enbuild.2025.115632)

- Achieved a **15.9%** reduction in MAE for 24-hour forecasting using a multi-source dataset approach.

- Implemented and compared multiple Transformer architectures, demonstrating PatchTST outperformance versus vanilla Transformer and Informer, and developed both zero-shot and fine-tuning transfer-learning pipelines.

Education

The University of Queensland — Doctor of Philosophy (Artificial Intelligence)   2026 — Present
Fully funded RTP Scholarship · SAAFE CRC top-up · Research focus: cross-sectoral digital twins for AMR risk assessment · Supervisors: Dr Noorul Amin & Professor Ricardo Soares Magalhães

Monash University — Master of Computer Science (Artificial Intelligence)   2024 — 2027
Part-time (Online) · GPA: 3.83/4.0 · Completed 9 of 12 units; remaining units planned concurrently following doctoral confirmation

Massey University — Master of Analytics (Health), Distinction   2023 — 2024
GPA: 8.17/9.0

The University of Waikato — Bachelor of Health, Sport and Human Performance   2020 — 2022
Double Major in Human Performance Science & Community Health

Publications

Spencer, R., Ranathunga, S., Boulic, M., van Heerden, H., & Susnjak, T. (2025).
Transfer learning on transformers for building energy consumption forecasting—A comparative study.
Energy & Buildings (Q1). [https://doi.org/10.1016/j.enbuild.2025.115632.](https://doi.org/10.1016/j.enbuild.2025.115632)