

Robert J. Spencer

AI Engineer | PhD Researcher in AI for Epidemiology

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Summary

AI Engineer and PhD Researcher delivering production ML systems and peer-reviewed research concurrently. At Radix Nutrition I built AI/ML optimisation systems that cut formulation iteration time by **90%+** and formulation costs by **25%+**. First-author Q1 publication in *Energy and Buildings* (2025). Now researching privacy-preserving digital twins for antimicrobial resistance (AMR) risk assessment at The University of Queensland and the SAAFE CRC.

Skills

- **Languages:** Python, SQL, R, JavaScript/TypeScript
- **Machine Learning:** PyTorch, scikit-learn, transformer models, time-series forecasting, transfer learning, optimisation
- **Data & Deployment:** Data pipelines, Pandas, Polars, Docker, CI/CD, PyQt, HPC
- **Research Focus:** Digital twins, synthetic data, federated learning, One Health / AMR risk assessment

Experience

Beyond Data — Brisbane, Australia

AI Engineer (Contract)

Jun 2026 — Present

Delivering end-to-end data and AI solutions for Australian businesses, working across the full delivery lifecycle alongside doctoral research.

- Translating client requirements into solution architecture, then building and deploying the data pipelines and ML systems that support it.
- Working across data engineering, ML development, and deployment as a single thread of ownership rather than a hand-off between specialists.

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.

- Developing privacy-preserving digital twin methods that integrate biological, environmental, agribusiness, and food-system data under a One Health framework.
- Applying synthetic data generation, federated learning, and transfer learning to address data scarcity and fragmentation across distributed data environments.
- Running scalable machine learning and simulation workloads on UQ's Bunya high-performance computing (HPC) infrastructure.
- Affiliated with the SAAFE CRC and supported by a fully funded RTP scholarship and SAAFE CRC top-up.

Radix Nutrition — Hamilton, New Zealand

Senior 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 Scientist

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 — Albany, Auckland, New Zealand

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 and Buildings* (Q1). DOI: [10.1016/j.enbuild.2025.115632](https://doi.org/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 — 2029 (expected)

- Fully funded RTP Scholarship and 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 (expected)

- Part-time and remote, undertaken alongside full-time work and research.
- GPA: 3.83/4.0 — High Distinction average.
- Completed 9 of 12 units; remaining units planned concurrently following doctoral confirmation.

Massey University — Master of Analytics (Health) 2023 — 2024

- Albany (Auckland) campus, hybrid delivery.
- GPA: 8.17/9.0 — awarded with Distinction.
- Research stipend funded by a Massey University MURF Seed grant, supporting ML approaches for occupant comfort and energy performance in commercial buildings.
- First-author Q1 publication in *Energy and Buildings* (2025).

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 and Buildings (Q1). <https://doi.org/10.1016/j.enbuild.2025.115632>.