

Toby Zayontz

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Profile

Electrical Engineering graduate specialising in embedded machine learning, signal processing and control. Experience deriving neural architectures for resource-constrained hardware, mapping computation to embedded accelerators, and integrating hardware–software systems. Seeking multidisciplinary roles developing autonomous systems, sensing technologies and embedded solutions for physical products.

Engineering Experience

H2PowerBox

2023–2024

Engineering Intern

- Designed high-level control flow and system architecture for an integrated solar–hydrogen off-grid power system, targeting integration with Enapter’s control framework.
- Selected and integrated valves, flow and temperature sensors, and relays, incorporating RS-485 and Modbus TCP communications into the system.
- Contributed to the first physical prototype through hydrogen piping layout design, component procurement with Swagelok, and collaboration with plumbers and electricians during assembly.

Selected Projects

Embedded Speech Separation on MAX78000

2025–2026

Two-person capstone project

- Derived a Conv-TasNet-based architecture around MAX78000 accelerator constraints, redesigning feature masking and temporal convolutions; trained a 103K-parameter model using 8-bit quantisation-aware training.
- Designed SRAM allocation for retained encoder features and residual activations; traced hardware–software output discrepancies to an Analog Devices SDK synthesis-tool bug affecting interleaved memory writes and implemented a fix.
- Achieved 5.16 dB SI-SDR in offline PyTorch evaluation. Measured accelerator inference of 8.7 ms met the 16 ms audio-frame processing deadline.

Team awards: *Best Project in Electrical & Electronic Engineering; Airwallex Award for Social Impact through Innovation.*

Autonomous Plant-Identification Robot

2025

- Developed ArUco-marker-based visual localisation and fused marker-derived pose estimates with wheel odometry using a Kalman filter.
- Developed computer vision for plant classification on NVIDIA Jetson hardware.

Delivery Optimisation

2026

Not-for-profit consulting

- Formulated a delivery-planning problem involving over 100 delivery locations and approximately six drivers as a mixed-integer linear program using Gurobi’s Python API.
- Applied k-means clustering to reduce optimisation problem size before solving the resulting MILP.

Technical Skills

Programming & Tools: C, C++, Python, MATLAB, PyTorch, ROS, Git, Gurobi.

Embedded & Hardware: MAX78000, sensors and actuators, RS-485, Modbus TCP, I²S/DMA audio pipelines, analogue circuit design and simulation (LTspice).

Signal Processing, Control & ML: Digital signal processing, Kalman filtering, LQR, MPC, optimal control, neural architecture design, embedded inference, quantisation-aware training.

Education

University of Melbourne

Master of Electrical Engineering (with Distinction)

2023–2026

Specialisation in Autonomous Systems. Exchange: University of Siena, Italy, Sep 2024–Feb 2025.

Bachelor of Science (First Class Honours)

2019–2022

Major: Electrical Engineering Systems.

Additional Experience

Avant Group

2025–Present

Analyst

Developed economic modelling underpinning Quantum Australia’s published assessment of its national programs. Contributed to strategy development and organisational direction for clients through research, analysis and stakeholder consultation. Additional work includes governance design and R&D Tax Incentive advisory.

Leadership & Community

Chairperson, Netzer Melbourne (2022) ■ Head of Junior Netzer Summer Camp (2022–2023) ■ Facilitator, Harmony Dialogues (2024).