Lucas Barbosa

Engineering (Honours) and Computer Science

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About Me

A bright future can be built with infinite energy and labour. These resources are constrained by physics and economics, but can become abundant by engineering at the edge. This is my life's mission. Ideas are my own maybelucas.com/posts.

Work Experience

Research Lead
PwC AI — Sydney Jan 2024 – present

- **Pioneered a novel trust-verification method for online content**, leading a 6-person team of academics and engineers to publish in a peer-reviewed journal.
- Deployed a game-theoretic incentive model with financial stakes to automate internet-scale information validation.
- **Authored a technical whitepaper** synthesising technical concepts developed with engineers and academics, and directed UI/UX development of the prototype.

Tech Lead
PwC — Sydney Jun 2023 – Jan 2024

- **Partnered with PMs and UX designers** to launch a wage-remediation product, driving ideation, engineering planning, user interviews, and the full product lifecycle.
- **Aligned cross-functional teams**, managing 10+ stakeholders and coordinating user interviews to deliver requirements under a 1-month timeline.
- **Reduced remediation turnaround times by 10%** through developing and integrating automated analysis methods for one of Australia's largest retailers using a Python ML stack.

Software Engineer
PwC — Sydney May 2022 – present

- Developed the Smart Audit Platform, a 10k MAUs web-based real-time collaboration platform built on 40+ microservices and AI models, served across 13 APAC and US markets on the back of a 5k msg/s RabbitMQ cluster.
- **Reduced frontend memory usage by 80%**, enabling 100+ page PDF rendering on low-resource browsers via Solid.js/React.js optimisations.
- Engineered a fault-tolerant graph-search microservice that purges 1TB/month with 99% reliability, reducing Postgres latency by up to 40% under peak loads.
- **Boosted dev productivity 5×** by introducing a modern multi-language monorepo toolchain and hosting technical workshops enabling four engineering teams with 29+ devs to scale to 100+ packages in the same codebase.
- **Fast-tracked to Senior Consultant**, becoming one of the youngest in the firm.

Software Engineer
Progue — Sydney 2021 – 2022

- **Built a DOCX data lake**, mined XML from thousands of Word file tokens and loaded it into a structured NoSQL model, creating an indexable firm-wide knowledge base.
- **Shipped a millisecond-latency vector search API**, enabling semantic queries over the data lake and cutting accounting workflows turnarond times by 3×.
- Containerized microservices with Docker + Kubernetes to enable zero-downtime deploys.

Software Engineer Intern
Cercle — Sydney 2021 – 2022

- **Launched a real-time QR-scanning platform**, rolling out a serverless AWS stack (Lambda, API Gateway, DynamoDB) that ingested 500+ cup scans / day and surfaced gamification metrics in under 200 ms.
- **Ran data-driven UX sprints**, leading in-person tests; insights cut scan errors 40% and boosted feature adoption.
- **Shaped the product roadmap**, co-prototyping four new features and translating them into engineering specs for the next funding round.

Founding Engineer
Lattice — Sydney 2016 – 2022

- Founded at age 16, delivering bespoke software to 5+ clients while maintaining academic excellence (ATAR 96.80).
- Scaled PHP codebases, implementing PSR-12 standards and caching to cut page loads 40%.

Publications

Barbosa, L., Kirshner, S., Kopel, R., Lim, E.T.K. and Pagram, T. (2025), "Toward trustworthy content: the role of challengers, juries and veracity bonds in digital media platforms", Industrial Management & Data Systems, Vol. ahead-of-print No. ahead-of-print. [Link] [Website]

Barbosa, L., Kirshner, S., Kopel, R., Lim, E.T.K. and Pagram, T., (2025). "A New Incentive Model For Content Trust", arXiv:2507.09972 [Link]

Education

University of New South Wales

- Pursuing B Eng (Honours) and Computer Science
- Honours student under Prof. Will Midgley developing advanced robotic learning algorithms
- Researcher in advanced shielding materials for nuclear fusion reactors
- 99/100 in Data Structures and Algorithms (COMP2521)
- 99.1/100 in Honours Thesis A (MMAN4951)
- Winner of UNIHACK '24
- Winner of Technion Yom Ha'Atzmaut '25

Oakhill College

- ATAR: 96.80[1]
- House captain
- Provincial's Excellence Award
- Founder of XYZ Mathematics club
- NCSS Summer School '18
- UNSW HS1917 '17
- UNSW ProgComp Distinction '17

Technical Skills

Programming Languages	C/C++, Rust, Python, JavaScript, TypeScript, SQL, PHP, Java, Assembly
AI/ML	PyTorch, XGBoost, JAX, RL, CNNs, LLMs, VLMs, VLAs
Control Systems	PID, Kalman Filters, LTI Systems, MATLAB, SolidWorks, ROS 2, Embedded
Molecular Dynamics	LAMMPS, Gadi HPC, Ovito, Steepest-Descent & conjugate gradient optimization
Framworks	React, Solid, Astro, Nest.js, Node.js
Cloud	GCP, Azure, AWS

[1] The ATAR (Australian Tertiary Admission Rank) is a percentile score from 0.00 to 99.95 that ranks high-school graduates for admission to Australian universities.