



Aayush Bajaj

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Summary

- Early-career AI/ML engineer (M. Stat) with strong interests in the Mathematics of Statistical learning. Equipped with the abstraction skills of a Computer Scientist (B. CompSci) and the practical architecting skills of a Software Engineer — I enjoy making end-to-end pipelines to deliver real products for real use-cases.

Education

University of New South Wales

Bachelor of Computer Science (AI), Minor Mathematics

Sydney, Australia

Feb 2021 – Sept 2025

University of New South Wales

Master of Statistics

Sydney, Australia

Feb 2027 – Dec 2029

Skills

Productionising: Nginx, Docker, Azure, Vultr

Software Development: Java, JUnit, Go, Typescript, Javascript, Python, C, SQL, noSQL, LaTeX

Libraries & Frameworks: NumPy, PyTorch, Matplotlib, Pandas, React, Svelte, Node

Deep Learning 🔗: Python, HPC, Pre-processing, Inference, Tuning, Jupyter, Conda

Linux: Shell, Git, Emacs, N/Vim, Tmux, Arch, Ubuntu, Debian

Languages: English (Fluent), Hindi (Proficient), Japanese (Beginner)

Projects

[Aayush Bajaj's Augmenting Infrastructure](#) 🔗

May 2023 – present

Multi-disciplinary Turing-complete notes that enable *Network Effects*.

- A mature pipeline built with Hugo and Emacs' org-mode. 1,073 exposed URLs.
- Influenced by Roam Research, Tiago Forte and Niklas Luhmann; Gruvbox themed.

[Biomedical Semantic Segmentation](#) 🔗

Oct 2024 – June 2025

Successfully created kidney and kidney tumour masks from 3D volumetric CT scans.

- Implemented 2D and 3D state-of-the-art semantic segmentation architectures on the KiTS19 dataset; achieved full marks with a class-leading Mean Sørensen–Dice score of 78.
- Reproduced nnU-Net pipeline end-to-end on Nvidia H200, A200 chips and published a concise report.
- Continued tuning to achieve official KiTS19 leaderboard ranking of #57 with improved Dice score of 0.9129

Medical Software WebApp

Alpha-Cure Medical Centre

Contract work to rebuild Best Practice Software desktop program as a remotely deployed web application.

- Scored a High-Distinction in this term-long project.
- Backend built in Python with Flask. Database in Azure SQL. Frontend built with React. Testing and coverage with Pytest and Cypress. Delivered in Docker.

[Dead Tree Segmentation](#) 🔗

Kaggle

Semantic Segmentations of live and dead trees from Satellite images.

- Read and implemented the UNet paper / architecture from scratch.
- Combined Dice and Focal loss to address 97% class imbalance. Raw IoU 0.66.
- 31,034,690 parameter count across encoder-decoder hierarchy. 0.71 IoU validation after morphological post-processing.
- Parallelised on High-Powered Compute with CUDA.

[Math Map](#) [↗](#)

Oct 2025 – present

3D map of mathematics, including high school, university, and research topics, with trading-card style visualisations.

- Built in Svelte, using an existing colour scheme and codebase from Shrine.
- JSON data backend with prerequisites visualised as floating arrows.
- Clickable cards with contributor and topic search functionality.

[Bytelocker](#) [↗](#)

June 2025 – present

Neovim plugin for quick buffer/region encryption and decryption; third refactor of a university project.

- Excellent region-level and full-file encryption bound to a small set of key mappings.
- Integrates smoothly into an existing Neovim workflow.

[Timeline](#) [↗](#)

May 2022 – present

An expanded Shrine. 2D visualisation of notable people, books and artworks plotted on a timeline.

- Built in Svelte to learn the framework.
- Images and historical facts included.

[Game of Life](#) [↗](#)

May 2025 – July 2025

Minimal JS Canvas implementation of Conway's Game of Life.

- Heatmap variant included.

[Mathematical Tools](#) [↗](#)

Mar 2025 – present

Collection of handy mathematical calculators and converters.

- Common number theory, stats, algebra, linear algebra, and unit/base converters served over a RESTful Go API.
- Static frontend deployed behind Nginx with a systemd service and HTTPS.

[BookBot](#) [↗](#)

Feb 2025 – present

Chatbot to discuss public-domain books with a GPT agent.

- OAuth2/JWT auth; vector search using embeddings in pgvector.
- Persistent block storage with caching and live processing status.
- Bun, Typescript, PostgreSQL, OpenAI

[10,000 Hours of ML](#) [↗](#)

Aug 2024 – present

Monolithic repository of self-contained Jupyter notebooks exploring AI, ML, CV, RL, and NLP.

- Version-controlled experiments and interview problems.
- Implementations for a wide variety of architectures and algorithms; supervised and unsupervised.

Experience

Software Engineer, Architect

Sydney, NSW

Technical Consultant

2024 – present

- Deployed, configured and version-controlled [Frizz Ande's site](#) [↗](#) and corresponding mail-server.

Contributor

Remote

Open Source

2021 – present

- Opened first **issue** on a Roam Research theme, and my first **pull request** on a plugin.
- Patched Mopidy source code; continued **bug reporting** in various repositories
- **Version controlled** answers to textbook exercises and **built my own original** apps and plugins.

Private Tutor

Eastwood, Sydney

Self-employed

2019 – 2023

- Coached high-school students in Mathematics and English; structured weekly drills and feedback to move grades from C/D ranges toward A/B.

Presenter

NSW

Connect Education

Jan 2022

- Built and delivered intensive "crash-course" seminars in Mathematics and English to HSC cohorts.
- Produced all slides and handouts in LaTeX.

Classroom Tutor

Eastwood, Sydney

XCD Education

2020 – 2021

- Produced and marked HSC English materials at scale; collaborated with staff on delivery timelines.
- Scaled a Notion workspace with deployable booklets tethered to proprietary databases.

Extra-curricular

Volunteer

West Ryde, Sydney

St. Vincent de Paul

Nov 2021 – Dec 2022

Giving back to the community is good. Doing that by shelving books is even better.

- Carried heavy objects around
- Shelved and unshelved books

Volunteer

Rhodes; Paramatta

Parkrun

2024 – present

Mens sana in corpore sano

- Sorting tokens (in quadratic time)
- Marshalling
- Barcode Scanning

Player, Captain, Coach

Sydney

Ultimate Frisbee

2022 – present

Engaged with this team-sport at many levels and in a number of enriching capacities:

- Local league player: NSU, Hills, Manly; coached (Hammertime) in Division 4
- University athlete representative: Silver Medal, 2023 University Nationals; Club Executive, 2024
- State Representative Athlete; MVP Medal Recipient
- National Club Open's and Mixed Player: Bench, Ironbark, Hills, NSU, Horizon, Manly

Certificates

[First Aid HLTAID011/010/009](#) 

Sept 2024 – Dec 2026

Australian Training Institute

[F2F Barista Skills Training](#) 

Oct 2025 – present

TCP Training

References

- Available upon request