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aayush bajaj

Software/ML Engineer · Computer/AI/Data Scientist
Mathematician

: abaj8494 ↗
: Aayush Bajaj ↗

Summary

Early-career AI/ML engineer (B.CompSci, AI stream) skilled at building **end-to-end ML systems**: data prep, model training and evaluation in Jupyter; productionising with modern tooling (APIs, containers, CI/CD). Clear docs, small demos, and measurable results. Correspondingly interested in the theoretical Mathematics and Statistics of ML – grad school deferred.

Skills

- **Languages:** Python, TypeScript/JavaScript, Java, C, Go, SQL, Lisp
- **ML & Data:** PyTorch, scikit-learn, NumPy, Pandas, OpenCV, Jupyter, PostgreSQL
- **Systems/Tools:** Linux (bash, vim, tmux, ssh, emacs), Git/GitHub, LaTeX, Docker, Kubernetes, CI/CD
- **Focus:** Computer Vision, Retrieval/RAG, Reproducible ML, Evaluation & Experimentation, Ethical AI

Projects

- **Kidney Segmentation (KiTS19)** — Leaderboard #57 ↗ *nnU-Net, Python, CV, HPC*
  - Reproduced nnU-Net end-to-end: data preprocessing, 5-fold training, validation and inference.
  - Wrote a concise technical write-up linking code, configuration, and results. Re-tuned for 6 months.
- **Bookbot** ↗ — Conversational Q&A over classic books *React/TS, Node/Express, PostgreSQL(pgvector)*
  - Auth (OAuth2/JWT), vector search with embeddings, persistent block storage + caching.
  - Web app with book grid, SVG covers, live processing status; usage caps and Stripe tiering.
- **Mathematical Tools** ↗ — 23 calculators & converters *Go API, Vanilla JS, Nginx, systemd, HTTPS*
  - Compact Go REST API powering number theory, combinatorics, stats, base/temperature, algebra, and linear algebra tools.
  - Static frontend with responsive grid; deployed behind Nginx with a systemd service.
- **Bytelocker** ↗ — Neovim plugin for quick file/snippet encryption *Lua*
  - Designed a lightweight workflow to encrypt/decrypt buffers or regions without leaving the editor.
  - Region level and full-file encryption (optionally) bound to a single keypress. Emphasis on documentation for adoption, built for modern Nvim plugin functionality; moderately customisable with multiple ciphers.
- **Personal Website** ↗ — A *critical mass* of prose and code *Python, MathJax, Emacs*
  - Publishes technical essays, project pages and interactive snippets; a practice of literate programming.
- **10,000 Hours of Machine Learning** — Monorepo ↗ *Jupyter*
  - A set of self-contained notebooks covering the drosophila of AI, ML, DL, CV and NLP.
  - Personal experiments, courses and interview problems version controlled.
- ***Static sites:** Sydney Train Game Solver ↗, Shrine ↗, Game of Life ↗, Math Map ↗ *Python, JavaScript*

Education

B.Science (Artificial Intelligence) — **University of New South Wales** — **2021–2025**

- AI stream; Mathematics minor — Sydney, Australia

Experience

Tutor (Private) — **Self-employed** — **2019–2023**

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

Presenter — **Connect Education** — **2022**

- Built and delivered intensive "crash-course" seminars in Mathematics and English to HSC cohorts.

Classroom Tutor — **XCD Education** — **2020–2021**

- Produced and marked HSC English materials at scale; collaborated with staff on delivery timelines.

Portfolio & Code

- abaj.ai ↗ | github.com/abaj8494 ↗ | bots.abaj.ai ↗ | tools.abaj.ai ↗

* references and transcript available upon request

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