JOSHUA KIRBY

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LinkedIn • GitHub • Portfolio

ML research and production AI engineering; native English and Japanese speaker.

EDUCATION

University of Birmingham — Expected 2027
BSc Artificial Intelligence & Computer Science — First Class Level (85% 2nd Year Average)

EXPERIENCE

University of Birmingham | Case Study — Birmingham, UK
EPSRC Summer Research Intern — *Jul – Sep 2026*

- Implemented targeted Whisper audio attacks using gradient-based optimisation and expectation over transformation; designed a **72-speaker study** comparing simulated call processing with controlled local and deployed calls.
- Found **51.6%** attack success in simulation versus **21.9%** in deployed calls; reduced the average local-to-deployed discrepancy from **11.1 to 7.4 percentage points** through network calibration.
- **First author** of a paper submitted to ICASSP 2027 on pre-deployment evaluation of targeted speech recognition attacks.

Genki Japanese and Culture School | Case Study — Fukuoka, Japan
Software Engineer — *Sep 2023 – Jun 2024*

- Independently built and deployed a production RAG chatbot for **two Japanese schools**, handling **14,000+ messages** from **2,000+ users** and saving approximately **70 staff-hours/week**.
- Improved retrieval precision from **43% to 62%** through an ablation study with **700+ relevance judgments**, evaluating query expansion and context retrieval.

The HALO Trust | Humanitarian Demining — Dumfries, UK
Technology Intern — *Dec 2021 – Apr 2023*

- Digitised **1,500+ building footprints** in Afghan satellite imagery using ArcGIS, creating ground-truth data for computer vision models used in humanitarian risk assessment.

TECHNICAL SKILLS

- **Languages:** Python, TypeScript, SQL, C, Java
- **ML & Research:** PyTorch, NumPy, adversarial audio, experimental design, statistical evaluation
- **AI & Backend:** RAG, LLM agents, Next.js, Node.js, SQL databases, vector databases
- **Infrastructure:** Linux, Docker, Git, AWS, Cloudflare

PROJECTS

AI Conversational Placement Test | Case Study — Pilot
Solo Project — *2024 – Present*

- Built an on-demand Japanese placement test that reduces a **two-week scheduling process to 30 minutes**; modelled a senior teacher's interview method as a state machine.
- Built and evaluated a multi-stage grammar extraction pipeline on approximately **600 manually annotated samples**, achieving **70% strict recall**.