Brian Hong

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Education

University of California, Los Angeles — Los Angeles, CA
Bachelor of Science: Computer Science and Mathematics — *Sept. 2023 – Present*

Experience

TablePal — Oct. 2024 – Present
Backend Developer — *On-site*
- Fine-tuned **GPT-4o-mini** chatbot with Reinforcement Learning from Human Feedback and constructed a JSON-prioritized decision tree.
- Built admin interface for toggling Mongo vector uploads between DEV/PROD environments.
- Implemented camera capture with **ONNX MobileNetV3** segmentation, leveraging quantized U8 tensors and OpenCV Canny edge detection to automate menu cropping.

Mayo Clinic — May 2024 – Sept. 2024
Software Engineer Intern — *Hybrid*
- Extracted and visualized 3D and FL data from **Holotomography (HT)** TomoCube image scans using **Unreal Engine**.
- Developed a full-stack **React-Django** software for converting TomoCube scans to .tga texture files for real-time pixel streaming.
- Integrated a **Gaussian Mixture Model** into the image pre-processing pipeline to segment background cells from texture maps, aiding early tumor localization and biological structure analysis.

Association for Computing Machinery (ACM) - AI Chapter — Aug. 2023 – Jun. 2024
Projects Intern — *On-site*
- Integrated generative models including latent diffusion and U-Net autoencoders to improve image reconstruction.
- Built an AI agent for LuxAI Kaggle competition using transformer-based action policy modeling in vector embeddings.

AP Computer Science A — Aug. 2022 – June 2023
Teacher Assistant — *On-site*
- Guided students with debugging and code review; assessed logic, syntax, and performance.
- Assisted in designing Java lesson plans and led hands-on collaborative instruction sessions.

Projects

AlgoCoach | *Next.js, LangChain, RAG* — July 2025 – Present
- Developing an AI-powered coding mentor and mock interviewer platform integrating **Next.js** frontend with a **Node.js** backend.
- Implemented a lightweight RAG pipeline using LangChain's **MemoryVectorStore** and **OpenAI Embeddings** to retrieve relevant algorithmic patterns during Q&A.
- Designed multiple interaction modes (*explain, debug, refactor, complexity*) with adaptive system prompts and interviewer mode that simulates realistic LeetCode-style technical interviews.

ObjDump AI | *Grounding DINO, SAM, Docker, React-Bootstrap* — Mar. 2024 – June 2024
- Zero-shot object detector with **Grounding DINO** and segmentation via **Meta's Segment Anything Model**.
- Built a UI for keyword-driven custom model training and dataset uploads.
- Deployed the app with **Docker** supporting both CPU and GPU using CUDA-accelerated scripts.

Erdős-Kac CLT | *Research Presentation, Theoretical Probability, Number Theory* — May 2022 – July 2022
- Explored CLT-like properties in the empirical distributions of prime divisors. Presented results to **The Euler Circle**.

Air Hockey | *Java, JFrame, KeyListener* — Mar. 2022 – June 2022
- Simulated 2-player air hockey with dual real-time controls and radius-based collision logic.

Technical Skills

Languages: C++, Python, SQL, Java, JavaScript, C, Lisp
Libraries: PyTorch, TensorFlow, OpenCV, Pandas, Matplotlib, Argparse
Tools/Editors: VS Code, Jupyter, Excel, Vim, Emacs, RStudio
Certifications: AWS Certified Cloud Practitioner, Stanford University Machine Learning Specialization