David Haolong Lee

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EDUCATION

University of Southern California (USC)   Los Angeles, California
Master of Science in Computer Science • GPA: 3.92/4.0   Aug 2024 – May 2025
Bachelor of Science in Computer Science (Engineering Honors) • GPA: 3.84/4.0   Aug 2020 – May 2024

TECHNICAL SKILLS

Coursework	Machine Learning, Object-Oriented Programming, Operating Systems, Algorithm Design
Programming Languages	Python, C/C++, Java, Javascript, SQL, HTML/CSS, Bash
Tools & Frameworks	Git, Linux, PyTorch, JAX, Pandas, React, matplotlib, scikit-learn, Espresso, JUnit, Firebase

PROFESSIONAL EXPERIENCE

Research Assistant *Interactive and Collaborative Autonomous Robotics Lab*   Jun 2022 – Present
- Engineered an open-source **Python** library to modularize quality diversity algorithms into reusable, object-oriented components, improving code reusability and streamlining their implementation and comparison.
- Devised a novel gradient-based feature diversification algorithm that uncovered 4x more unique features in high-dimensional spaces compared to state-of-the-art methods.
- Accelerated density estimation by 1.5x and neural network evaluation by 2x using **PyTorch** and **JAX** optimization techniques.

Teaching Assistant (Discrete Math & Algorithms) *USC*   Jan 2023 – May 2024
- Built an open-source **Python** library for dynamic programming visualization, boosting student comprehension through real-time feedback, interactive learning, and iterative practices.
- Assessed assignments and mentored 150+ students during office hours on algorithm design, proofs, and mathematical reasoning.

Co-Founder *Licon Graphics*   May 2022 – May 2023
- Finetuned **Stable Diffusion** model in **PyTorch** to generate high-fidelity and high-novelty subject-driven images.
- Deployed scalable generative pipelines on **Google Cloud**, reducing inference latency and enabling real-time image delivery.
- Conducted weekly strategy meetings to define market research goals, identify target customers, and plan the product prototype roadmap.

PROJECTS

dpvis (dpvis.readthedocs.io)   Jan 2024 – Aug 2024
- Developed an open-source Python library that features auto-generated, interactive visualizations for dynamic programming algorithms, including self-testing features that prompt users with interactive questions about the algorithm's steps.
- Managed a team of five in monthly sprints and weekly stand-ups to gather stakeholder feedback and drive iterative development.
- Designed a decoupled, event-driven architecture (**Plotly Dash + Python**) to support modular feature expansion and maintainability.
- Implemented industry-standard development practices: **GitHub Automation** for code reviews, **pytest** for comprehensive unit testing, and **mkdocs** for professional documentation, drastically reducing manual overhead.

pyribs (pyribs.org)   Jun 2022 – Dec 2023
- Maintained an open-source **Python** library for implementing quality diversity algorithms, earning 200+ stars on GitHub.
- Addressed 15+ bug reports and feature requests on GitHub to improve API consistency and reduce redundancy across modules.
- Extended the library with gradient-based optimizers under object-oriented patterns, maintaining backwards compatibility and improving efficiency for differentiable tasks by 2x.
- Authored detailed **Jupyter Notebook** tutorials on upgrading legacy algorithms with modern threshold adaptation techniques.

USC DoorDrink   Jan 2022 – May 2022
- Built an **Android** application enabling coffee shop discovery and mobile ordering, using **Java**, **Firebase**, and **Google Maps API**.
- Engineered map integration with real-time routing and location-based filtering to enhance user experience.
- Structured a real-time database with event-driven updates for live order tracking and restaurant availability.
- Revamped the UI using **Jetpack Compose** and **XML** to modernize app visuals and improve accessibility.
- Developed robust test suite using **Espresso** and **JUnit** to ensure fault tolerance and UI responsiveness.