Jack Hogan

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Computer Science and Artificial Intelligence double major (minor in Mathematics) with hands-on experience in software engineering, AI/ML research, and technical leadership. Passionate about deep reinforcement learning and developing systems that enable models to reason, adapt, and learn complex behaviors. Experienced in creating production-ready software and advancing machine learning architectures, with applications in robotics, vision, and low-data learning. Seeking opportunities to contribute to impactful projects at the intersection of applied AI research and scalable, high-performance systems.

Education

Purdue University Honors College   Fall 2022 — Spring 2026
Computer Science B.S., Artificial Intelligence B.S.; Minor in Mathematics; Graduating Spring 2026   *West Lafayette, IN*
- 3.7 GPA
- Relevant Coursework: Data Structures, Graduate Machine Learning, Artificial Intelligence, Analysis of Algorithms, Abstract Algebra
- Study Abroad: University College Dublin, Spring 2024 — Coursework in cognitive psychology, philosophy of mind, and human decision-making related to AI's cognitive, reasoning, and ethical foundations.

Work Experience

Era Computer   September 2025 — Present
Fellow   *San Francisco, CA/Remote*
- Creator and lead engineer of Beacons, a hardware/software solution for fostering real-time social connections at events.
- Implementing complex techniques including RF design, high-frequency signal management, and constrained environment development.
- Designing a cohesive software stack for registering, finding, and collaborating with Beacons using traditional and LLM-based machine learning techniques.

Peraton Labs   May 2025 — Present
Machine Learning Researcher   *Silver Spring, MD*
- Created a new pipeline for concurrently testing different GNN architectures, speeding up testing by 2-3x.
- Investigated and implemented multiple bleeding-edge GNN architectures, improving task accuracy by 50%+.
- Developed and presented a technical report on a novel GNN architecture, demonstrating significant performance gains and guiding next-phase research.

Leidos Innovation Center   May 2024 — August 2024
Software Engineering Intern, High-Performance Systems   *Arlington, VA*
- Created and refined GPU-based signal processing algorithms in CUDA, Rust, and Python for real-time applications, improving performance by 400%.
- Developed a real-time machine learning system to lock onto hidden radar targets using PyTorch with 85%+ accuracy.
- Resulting work will be deployed to active defense platforms.

Peraton   May 2023 — August 2023
Software Engineering Intern   *Chantilly, VA*
- Automated document processing systems using AI-based parsing systems to increase processing efficiency.
- Authored and presented a whitepaper on systems and processes developed.
- Managing daily intern standups and kept tasks on track.
- Created data ingest and management dashboards for U.S. contractors.

Alluja LLC   2020 — Present
Founder   *Chantilly, VA*
- Creator of multiple products including mobile apps (SwiftUI), libraries (Swift, Rust), backend servers (Rust, Python), and frontends (Svelte, Leptos) impacting 5,000+ users.
- Komori, a Discord Siri Shortcuts integration, with paid downloads on the App Store.
- Alluja WebSockets, a WebSocket testing client for macOS, with 100+ downloads.

Research & Leadership

Purdue Hackers   Jan 2022 — Present
Engineering Division Lead & Interim President   *West Lafayette, IN*
- Overseeing all engineering projects for Purdue Hackers, a 2000+ member student organization focused on innovation and rapid prototyping.
- Managed a team of 10+ officers, balancing budget and time constraints while delivering multiple large-scale technical initiatives.
- Designed and maintained infrastructure for the Passports initiative, including authentication and management systems in Rust and TypeScript, supporting hundreds of active users.
- Led development of The Sign, a meter-tall Conway glider installation representing the club's logo; project was accepted to Hackaday and drew 1,000+ online views.
- Spearheading the Beacons project in collaboration with Era Computer, deploying early prototypes at student events.
- Organized and ran major events, including a 200+ person callout, hack nights, and technical workshops, while guiding a smooth presidential transition.

Detecting Source Code Plagiarism in Submitted Assignments   Spring 2023 — Fall 2025
Lead Researcher   *West Lafayette, IN*
- Selected by Purdue faculty to lead an independent research project addressing plagiarism detection in the Computer Science program.
- Designing a language-agnostic detection system using Abstract Syntax Trees, parsing techniques, and machine learning to identify similarity beyond surface-level code patterns.
- Conducted large-scale testing across multiple courses, targeting 1,000+ student submissions annually to improve fairness and academic integrity.
- Preparing a sole-author paper for submission to NeurIPS presenting novel methods for scalable, cross-language plagiarism detection.

Purdue Orbital   Jan 2023 — Jan 2025
Avionics Design Lead   *West Lafayette, IN*
- Led a team of 15+ members to create a custom fault-tolerant system for rocketry systems.
- Developed systems for collecting data for avionics missions using Rust.

Skills & Associations

- **Programming Languages**: Java, C#, Python, SQL, MongoDB, Swift, Kotlin, Svelte, JavaScript, TypeScript, HTML, CSS, Rust, C, C++
- **Technologies**: SvelteKit, Django, Actix Web, Flask, Spring Boot, Express, SwiftUI, UIKit, Jetpack Compose, React, Leptos, GStreamer, Unix, Systemd, PulseAudio, CUDA, CUTLASS, NumPy, PyTorch, Pandas, Burn, SciPy, Astro
- **Platforms**: EC2, ECS, S3, Docker, Docker Compose
- **Associations**: Purdue Hackers, Purdue Orbital, Purdue University Ski & Snowboard Club, Boiler Book Club, Purdue Theme Park Engineering & Design, Mensa International