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.

Experience

Era Labs
Fellow

September 2025 — Present   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
Machine Learning Researcher

May 2025 — Present   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
Software Engineering Intern, High-Performance Systems

May 2024 — August 2024   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
Software Engineering Intern

May 2023 — August 2023   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
Founder

2020 — Present   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.

Objective

Machine learning researcher with a passion for deep reinforcement learning, where I hope to discover new and innovative ways to make models learn complex policies with applications in problem analysis, critical thinking, robotics, vision, and low-data learning. Seeking opportunities to leverage technical expertise, leadership skills, and a commitment to innovation in challenging and impactful projects revolving around deep reinforcement learning, reasoning, policy optimization, and robotics.

Education

Purdue University Honors College
Computer Science B.S., Artificial Intelligence B.S.; Minor in Mathematics; Graduating Spring 2026

Fall 2022 — 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.

Skills/Exposure

- Java
- C#
- Python
- SQL
- MongoDB
- Swift
- Kotlin
- Svelte
- JavaScript
- TypeScript
- HTML
- CSS
- Rust

- C
- C++
- 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

- 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

Engineering Division Lead & Interim President

📅 Jan 2022 – Present   📍 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

Lead Researcher

📅 Spring 2023 – Fall 2025   📍 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

Avionics Design Lead

📅 Jan 2023 – Jan 2025   📍 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.

Tools

- 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