

# 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 Computer

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

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|--------------|-------------------|--------------|
| • Java       | • C               | • GStreamer  |
| • C#         | • C++             | • Unix       |
| • Python     | • SvelteKit       | • Systemd    |
| • SQL        | • Django          | • PulseAudio |
| • MongoDB    | • Actix Web       | • CUDA       |
| • Swift      | • Flask           | • CUTLASS    |
| • Kotlin     | • Spring Boot     | • NumPy      |
| • Svelte     | • Express         | • PyTorch    |
| • JavaScript | • SwiftUI         | • Pandas     |
| • TypeScript | • UIKit           | • Burn       |
| • HTML       | • Jetpack Compose | • SciPy      |
| • CSS        | • React           | • Astro      |
| • Rust       | • Leptos          |              |

- 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

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### 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

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- EC2 • ECS • S3 • Docker • Docker Compose

## Associations

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- Purdue Hackers
- Purdue Orbital
- Purdue University Ski & Snowboard Club
- Boiler Book Club
- Purdue Theme Park Engineering & Design
- Mensa International