

# Joshua Goldberg

Boston MA | (857)-222-5733 | [goldberg.josh@northeastern.edu](mailto:goldberg.josh@northeastern.edu) | [joshg.pl](https://joshg.pl) | Available April 2026 - Dec 2026

## Education

**Northeastern University - Boston, MA | Khoury College of Computer Sciences**

*Sept 2023 - Present*

*Candidate for a B.S. in Computer Science, Minor in Mathematics*

*Expected April 2027*

**Honors:** GPA 4.0/4.0 | Dean's List (4 semesters) | Honors Scholarship

**Relevant Courses:** Software Engineering, Programming Languages, Algorithms (Graduate), [CS7470](#) Influential Ideas in Programming Languages (Audit), Object Oriented Design, Distributed Systems, Accel Fundamentals CS 1 & 2

## Knowledge/Expertise

**Programming Languages:** Lean, Java, Python, Javascript/Typescript, HTML/CSS, Rocq, OCaml, Racket, C

**Applications/Systems:** Git, Docker, Node.js, React, Postman, VSCode, Prisma, DrRacket, Qt, IntelliJ, PyCharm, n8n

## Projects

**OwlLean** [\[source\]](#)

*Aug 2025 - Feb 2026*

- Developed a typechecker and parser in Lean 4 for [Owl](#), integrating subtyping, information flow, and label corruption
- Implemented bidirectional typing inference and automatic tactics for proof generation to enable more robust representations and ensure proper typechecking of arbitrary information flow constraints
- Constructed example cryptographic programs to emulate and typecheck concurrency using state machines
- Devised performance optimizations, improving runtimes by over 2x compared to unoptimized tests

**Cybersecurity TA Discord Bot** [\[source\]](#)

*June 2025 - Nov 2025*

- Led the development of a Retrieval-Augmented Generation integrated discord bot leveraging Python, GPT-4 API, and [n8n](#) workflow automation to assist 200+ students with cybersecurity coursework
- Authored and presented research at CISSE, demonstrating system design and an 80% student helpfulness rating

**osu!mania Replay Renderer** [\[source\]](#)

*Aug 2024 - March 2025*

- Implemented a Java application that parses LZMA compressed game data and converts it to MP4 format by recreating the game environment, using 7Zip and FFmpeg
- Iteratively refined rendering accuracy and performance through user feedback, achieving sub-minute render times via optimized OOP design patterns with additional user configurable optimization options

**Lean Measure**

*Nov 2025 - Present*

- Collaborating weekly with researchers to develop a Lean 4 theorem prover grounding probabilistic programming in measure theory and separation logic

## Experience

**Research Assistant - Northeastern University - Boston, MA**

*Jul 2025 - Present*

- Designing automated typechecking methods for cryptographic languages (e.g., [Owl](#)) in Rocq and Lean 4
- Proved non-interference and well-bracketed lemmas across multiple security language representations

**Technical Lead - Northeastern University Electric Racing - Boston, MA**

*April 2025 - Present*

- Lead a team of 5+ developers working in React and Typescript, assigning tickets and reviewing pull requests weekly
- Overhauled the Finance and Calendar pages via Prisma and SQL filtering, cutting management overhead and improving load times for 100+ members across multiple subteams

**Logic and Computation Teaching Assistant - Northeastern University - Boston, MA**

*Jan 2025 - Present*

- Mentor 70+ students through weekly office hours, preparing them for proof-based exams and assignments in formal logic and property-based testing
- Maintain autograder infrastructure and course documentation in Racket and OCaml, and collaborate with faculty to design assignment rubrics and exam problems

**Interests :** Piano | Theorem Provers | American Numismatics | Programming Languages