

# Joshua Goldberg

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## 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:** Programming languages, Algorithms (Graduate), Object Oriented Design, Distributed Systems, Computer Systems, Accel Fundamentals of Computer Science 1 & 2, Accel Discrete Structures

## Knowledge/Expertise

**Programming Languages:** Rocq, Lean, Java, Python, C++, Racket, Javascript/Typescript, HTML/CSS, TLA+, C  
**Applications/Systems:** Git, Docker, Node.js, React, Postman, VSCode, Prisma, DrRacket, Qt, IntelliJ, PyCharm, n8n

## Projects

**Lean Measure** *Nov 2025 - Present*

- Mechanizing aspects of measure theory and sigma algebra to create a working version of [Lilac](#) in Lean 4
- Constructing a measure theory based framework defining probability spaces, and writing a separation logic on top of it to reason about probabilistic programs

**OwlLean [\[source\]](#)** *Aug 2025 - Oct 2025*

- Developed a typechecker and parser in Lean 4 for the [Owl](#), integrating subtyping and information flow
- Implemented bidirectional typing inference and automatic tactics for proof generation to enable more robust representations and ensure proper typechecking of arbitrary information flow constraints
- Devised performance optimizations, improving typechecking time by over 200% compared to unoptimized runs

**Cybersecurity TA Chatbot [\[source\]](#)** *June 2025 - Present*

- Assisted in the development of an AI powered chatbot leveraging GPT-4 API, Python, and [n8n](#) workflow automation to assist students with general cybersecurity questions and coursework
- Used in both remote and online versions of Northeastern's foundational cybersecurity course, serving 200+ students
- Wrote a paper and presented at the [CISSE](#), showcasing system design and positive classroom deployment statistics

## Experience

**Research Assistant - Northeastern University - Boston, MA** *Jul 2025 - Present*

- Advised by [Joshua Gancher](#), working with Rocq and Lean 4 to formalize features of [Owl](#) and [Lilac](#)
- Realizing novel ways to express typechecking, allowing for more automated systems utilizing proofs

**Technical Lead - Northeastern University Electric Racing - Boston, MA** *April 2025 - Present*

- Oversee a team of web developers, assigning tickets and conducting weekly checkins to ensure deadlines are met
- Updated the Finance and Calendar pages, allowing for significantly easier tracking of allocated team funds and meeting schedules, alongside improved efficiency through the utilization of Prisma and SQL for backend filtering

**Teaching Assistant - Northeastern University - Boston, MA** *Jan 2025 - July 2025*

- Hosted weekly office hours and engaged with students to properly prepare them for exams and assignments
- Helped to improve course documentation for Logic and Computation, and aided in overhauling Foundations of Cybersecurity projects, prioritizing interactive assignments over typical writing tasks

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