Zack Eisbach

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Boston, MA | Available May - December 2024

EDUCATION

Northeastern University | Boston, MA   September 2022 - May 2026
Candidate for Bachelor of Science in Computer Science and Mathematics   Boston, MA

Awards:	Honors Program | **GPA : 4.0 / 4.0**
Coursework:	Programming Languages | Compilers | Algorithms | Object-Oriented Design
Extracurriculars:	Math Club | Competitive Programming Club | Oasis Dev Club

TECHNICAL SKILLS

Languages:	Haskell | OCaml | Java | Python | Racket/Scheme | Coq | JavaScript | React | HTML/CSS
Tools:	LaTeX | Git | Emacs | Wolfram Mathematica

EXPERIENCE

Khoury College of Computer Sciences   December 2023 - Present
Research Assistant   Boston, MA
- Collaborate with Prof. Amal Ahmed and graduate student Andrew Wagner to contribute to an ongoing research project, using realizability models to specify safer and richer interoperability
- Review contemporary literature and participate in one-on-one mentorship sessions to gain a working knowledge of rich type systems, step-indexed logical relations, and separation logic

Khoury College of Computer Sciences   September 2023 - Present
Teaching Assistant for Accelerated Fundamentals of Computer Science   Boston, MA
- Prepare reference solutions, craft autograder test suites, conduct office hours, and grade weekly assignments to provide a class of 60+ students with comprehensive support and feedback
- Direct weekly lab sessions for a cohort of 30+ students, expanding upon classroom concepts
- Design solutions with intentionally subtle errors to assess the robustness of student-written tests

University of Connecticut   June 2021 - October 2021
Research Assistant   Storrs, CT
- Developed, rigorously tested, maintained, and presented a Python tool for transforming proprietary outputs of RANGER-DTL into the globally used RecPhyloXML format

PROJECTS

Kellisp | Haskell, Megaparsec, Hspec
- Engineered an interpreter and robust test suite for a Scheme-like language, achieving compliance with the majority of language features specified in the R5RS standard
- Crafted a custom lexer and parser using parser combinators and leveraged monad transformers to enable effective evaluation and provide specialized, informative error messages for users
- Implemented support for both batch processing and interactive usage with user-defined libraries

NEU Dining VS | React, Tailwind, Redis
- Developed a sleek web app allowing students to quickly and conveniently compare meal options across Northeastern campus dining halls, with load times up to 700% faster than competing sites
- Accommodated students with dietary restrictions using varied filtering and sorting functionalities
- Created and maintained a Redis-integrated API, facilitating lightning-fast access via daily caching

x86_64 Compiler | OCaml, C, Assembly
- Implemented a multi-pass compiler from a functional language with Python-like syntax to x86_64 assembly, supporting dynamic type-checking, recursive functions, and tail call elimination

- Transformed source-level code into A-normal form, performed desugaring passes, and enforced various well-formedness constraints, delivering specialized error messages to end users