

Arthur De Belen

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EDUCATION

Massachusetts Institute of Technology

August 2024

Bachelor of Science (S.B.) & Master of Engineering (MEng.), Computer Science and Engineering

Cambridge, MA

- **GPA: 4.9/5.0** (undergraduate cumulative), **5.0/5.0** (graduate cumulative).
- Master's thesis title: "[Feasibility of Vector Instruction-Set Semantics Using Abstract Monads](#)".
- President/Producer, [MIT Musical Theater Guild](#); Puzzle Team, [Next Haunt](#) (escape room-designing club); Next House Campus Preview Weekend / Residence Exploration Chair.

PROJECTS

GitHub profile (for source code for projects): github.com/0adb

Compiler for C-like programming language

- Implemented in Go and Bash a compiler targeting x86 assembly for a C-like language specified by course instructors for a class project, working with two other students as part of a class project.
- Produced a compiler artifact that passed 100% of functionality tests prepared by course instructors.

CSV Parser

- Implemented a CSV parser for Python3 using extension modules written in C and CPython's C/Python interoperability, working with three other students as part of a class project.
- Incorporated techniques developed by prior academic research to improve speed of certain database queries on CSVs, and obtained a 30% decrease in query computation time compared to a pure Python implementation.

(In-progress) Compiler for a subset of C17

- Following Nora Sandler's book [Writing a C Compiler](#), writing a compiler in C++ that will compile C down to x64 assembly, using the CMake build system.

WORK EXPERIENCE

Computer Science and Artificial Intelligence Laboratory (CSAIL @ MIT)

Sep. 2022 - May 2024

Undergraduate / Graduate Research Assistant

Cambridge, MA

- Implemented compiler optimizations for research language Bedrock2, a C-like programming language with a compiler written in Coq.
- Reduced the number of assembly instructions generated by a specific form of source language statement by 50%.
- Utilized knowledge of Coq, RISC-V, and Haskell, and worked in the Programming Languages and Verification Lab under Prof. Adam Chlipala.

Astranis

Jun. 2021 - Aug. 2021

Intern, Flight Software Team

San Francisco, CA

- Utilized knowledge of C++ and Python to rewrite sections of the satellite's power management and control code to reduce blocking on certain tasks.

Massachusetts Institute of Technology (MIT)

Sep. 2021 - May 2022

Grader, 6.046/6.1220 [Design and Analysis of Algorithms]

Boston, MA

- Graded homework for roughly 20-30 students, for 5 hours a week, for the second in a three-semester series of algorithms courses.

SKILLS & INTERESTS

- **Skills:** Git; Coq; Go; Python; Emacs; OCaml; C++; Rust; Visual Studio Code; CMake
- **Interests:** Compilers; automata theory; weightlifting; musical theater; *Minecraft*