

Daniel Ng

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Education

Carnegie Mellon University
Bachelor of Science
Computer Science, May 2024

QPA: 4.0

Relevant Coursework:

- Concentration in Principles of Programming Languages
- Great Ideas in Theoretical Computer Science
- Introduction to Computer Systems
- Parallel and Sequential Data Structures and Algorithms
- Foundations of Programming Languages
- Probability and Computing
- Distributed Systems
- Algorithm Design and Analysis
- Compiler Design
- Introduction to Computer Security
- HOT Compilation

Inglemoor High School
International Baccalaureate
Diploma Recipient
Kenmore, WA, June 2020

GPA: 3.995

Skills

Programming Languages:

C++ · C · SQL · OCaml ·
Assembly · Rust · Java · Python ·
C# · SML · LaTeX · MATLAB · Go
· HTML · CSS · JavaScript

Activities

CMIMC

Logistics director,
problem-writer, awards
ceremony coordinator

American Mathematics Competitions

5-time AIME qualifier, attained
an AIME score of 9 in 2020

Work Experience

Meta / Facebook · Software Engineering Intern May-Aug 2022

- Worked on Presto, an open-source distributed SQL query engine for big data and Velox, the underlying C++ vectorized database acceleration library.
- Made some common worker-node database filters run 2 to 5 times faster when reading from files via code optimization and improved data structures.
- Improved speeds of some production queries by up to 28 percent.

Carnegie Mellon University · Head Teaching Assistant Jul 2021-Dec 2022

- Summer/Fall 2021 - taught 15-122: Principles of Imperative Computation
- Spring/Fall 2022 and 2023 - taught 15-210: Parallel and Sequential Data Structures and Algorithms. Head teaching assistant from Fall 2022 to Fall 2023.
- Led collaborative lab sessions as well as classroom-based recitations.
- As head TA from Fall 2022-23, managed a course staff of 23 TAs and worked directly with professors to improve course content and maximize student learning.

University of Washington Applied Physics Lab · Research Intern Jun-Sep 2019, Jun-Sep 2020

- Interned on a team studying medical imaging technologies with the neuroscience department.
- Optimized MATLAB code for reconstructing plane-wave ultrasound scans of rats.
- Created a Python tool allowing users to identify blood vessels in images, which automatically calculated vessel diameters and blood-flow velocities.

Selected Projects

C0 Compiler · 15-411 Compiler Design

- Created a compiler for C0, a subset of the C programming language with a partner.
- Added type-checking, functions, arrays, structures, and an -O1 optimization level
- Added flags to enable type-checking modes that correspond to ordered/linear modal logics.

Dynamic Memory Allocator · 15-213 Introduction to Computer Systems

- Wrote an implementation of malloc and free to dynamically allocate heap memory.
- Code outperforms the stdlib allocations in throughput with minimal wasted space.

Research

I was advised by Prof. Frank Pfenning for my senior thesis at CMU. We investigated ways that memory reuse could be used to improve the performance of a process-based language. The final thesis was titled "Memory Reuse in Linear Functional Computation" and earned honors from the School of Computer Science.

I previously did neuroscience research at the University of Washington's Applied Physics lab. It was used in the following papers:

- Contrast-Enhanced Ultrasound for Assessment of Local Hemodynamic Changes Following a Rodent Contusion Spinal Cord Injury, Z. Khaing et al., *Military Medicine*, 2020.
- Transcutaneous contrast-enhanced ultrasound imaging of the posttraumatic spinal cord, Z. Khaing et al., *Spinal Cord*, 2020.

Awards and Honors

- *CMU School of Computer Science, Dean's List with High Honors*, Fall 2020 - Spring 2024
- *Alan J. Perlis Undergraduate Student Teaching Award*, May 2024
- *Phi Beta Kappa*, May 2024
- *CMU Senior Leadership Recognition Award*, May 2024