Daniel Ng

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Education

Carnegie Mellon University
Bachelor of Science
Computer Science, May 2024

QPA: 4.0

Relevant Coursework:

- Principles of Imperative Computation
- Matrices and Linear Transformations
- Principles of Functional Programming
- 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

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

GPA: 3.995

Skills

Programming Languages:
C++ · C · SQL · OCaml · Java · Python · C# · SML · LaTeX · MATLAB · Go · x86 Assembly · 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.

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 by exploiting parallelism to make it run up to 20 times faster.
- Created a Python tool allowing users to identify blood vessels in images, which automatically calculated vessel diameters and blood-flow velocities.

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

- Summer/Fall 2021 - taught 15-122 Principles of Imperative Computation
- Spring/Fall 2022 - taught 15-210 Parallel and Sequential Data Structures and Algorithms
- Led both collaborative lab sessions and classroom-based recitations.
- As head TA in Fall 2022, managed a course staff of 20 TAs and worked directly with professors to improve course content and maximize student learning.

Selected Projects

Proxy Server · 15-213 Introduction to Computer Systems

- Built a concurrent web proxy with caching in C to forward outgoing HTTP requests.
- Designed a software cache to store recent responses to handle repeat requests.

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 heap space.

EduTalk · Technology Student Association 2019

- Created message board software intended for public schools and school computers created in C# using the .NET framework.
- Placed 5th in Software Development at the TSA National Conference.

Research

The work done at the University of Washington was used in the following papers co-authored by my supervising faculty member:

- Contrast-Enhanced Ultrasound for Assessment of Local Hemodynamic Changes Following a Rodent Contusion Spinal Cord Injury, Z. Khaing et al., *Military Medicine*, 2020.
- High-Frequency Nonlinear Doppler Contrast-Enhanced Ultrasound Imaging of Blood Flow, M. Bruce et al., *IEEE transactions on ultrasonics, ferroelectrics, and frequency control*, 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*, December 2020 - Present
- *Inglemoor High School Salutatorian*, June 2020
- *National Merit Semifinalist*, February 2020