

Chia-Lun (Charles) Tsai

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EDUCATION

University of Illinois, Urbana-Champaign

Champaign, IL

Master of Computer Science

Aug. 2024 – Dec. 2025 (Projected)

- **GPA: 3.95/4.0**
- **Relevant Coursework:** Cloud Storage Systems | Distributed Algorithms | Applied Parallel Programming | Lang & Abstractions for HPC | Programming Languages and Compilers | Compiler Construction

National Yang Ming Chiao Tung University (NYCU)

Hsinchu, Taiwan

Bachelor of Science in Computer Science

Sep. 2019 – Jun. 2023

- **GPA: 4.11/4.30**

WORK EXPERIENCE

Microsoft Corporation

Seattle, WA

Software Engineer Intern | C++, Python

May 2025 – Aug. 2025

- Initiated and built CIMAnalyzer, an **end-to-end debugging and visualization tool** that renders Composite Image File System (CimFS) raw binary files into human-readable views with a navigable tree and hex display
- **Enhanced filesystem diagnosability** by enabling monitoring 3 different file format and combinations, providing error notification during data transformation, and visualizing field relationships within a unified interface
- Achieved a **90% reduction** in debugging time, with the tool seamlessly integrated into the team's daily workflow
- Improved CimFS visibility by implementing a Windows API that enables querying file counts within the filesystem

NVIDIA Corporation

Taipei, Taiwan

Software Engineer Intern | C++, Python

Jun. 2022 – Dec. 2022

- Enhanced next-generation GPU boot firmware test coverage **from 40% to 80%** by implementing over 20 Python and Bash penetration tests and 15 fuzzing tests
- Accelerated error analysis **from several hours to 10 minutes** by developing an automated program that collected and identified top failing code modules in nightly GitLab pipeline tests

PROJECTS

Fast Fourier Transform on CPU and GPU | C++, CUDA

Jun. 2025

- Implemented Fast Fourier Transform algorithms for sizes 4 to 2048, achieving results comparable to SOTA libraries such as FFTW on CPU and VkFFT on GPU
- Developed DFT (naive), Cooley-Tukey, and Stockham, algorithm with three different settings of radix values

COOL Compiler | C++

Dec. 2024

- Designed a compiler for a C-like language, handling lexical/syntax parsing, code generation, and register allocation
- Used Flex/Bison for lexer/parser, LLVM IR for code gen target, and greedy allocation algorithm for allocator

Self-Studied MIT 6.5840 Distributed Systems | Go

May 2024

- Completed all 5 labs, including implementing a fault-tolerant Raft consensus algorithm, a distributed database, and a scalable architecture using sharding
- Used RPC for server communication and learned distributed systems concepts such as fault tolerance, replication, consistency, and scalability

Bare Metal Programming | C, C++, ARM assembly

Jun. 2022

- Developed a UNIX-like operating system from scratch on bare-metal environment on Raspberry Pi 3b+
- Implemented bootloader, interrupt service routine, context switch, virtual memory, and filesystem supports FAT32

SKILLS

Programming Languages : C++, Python, Shell/Bash (2 internships & projects), Go (project), Javascript (project)

Tools / Frameworks / Platforms : Vim, Git, GDB, Linux, Ubuntu, MongoDB, CUDA, LLM, GPT, PyTorch, Agile