

# William Liu

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## Education

### The University of Texas at Austin

M.S. in Computer Science  
*Thesis: Summarizing Critiques  
Concerning Graphical Topics*  
May 2023 (Part Time, Remote)

### Carnegie Mellon University

B.S. in Cognitive Science  
Minor in Computer Science  
May 2020

## Engineering

### Languages:

Python, TypeScript, C, C++, OCaml

### Machine Learning Tools:

Tensorflow, PyTorch, NumPy,  
Pandas, NLTK, Huggingface

### Compiler Tools:

LLVM, MLIR, TACO

## Web Development

### Frontend:

React, NextJS, React Query, Urql

### Backend:

Fastify, Flask, FastAPI, Prisma 2,  
Express, Apollo-Server

### Databases:

MongoDB, PostgreSQL

### Infrastructure:

AWS, DigitalOcean, Firebase,  
Heroku, Docker

## Design

### Design Tools:

InDesign, Photoshop, Figma

## Select Coursework

### Theory:

Topics in Deep Learning  
Parallel Algorithms  
Functional Programming  
Computational Perception  
Numerical Analysis

### Systems:

Optimizing Compilers  
Parallel Computer Architecture  
Advanced Operating Systems

## Experience

### CoPilot // Pittsburgh, PA (Remote)

#### Backend Systems Engineer // Aug 2021 – Present

- Build, manage, and maintain the entire backend infrastructure
- Manage data and metrics pipelines and perform business analytics

### SambaNova Systems // Palo Alto, CA

#### Software Engineer // Jun 2020 – Aug 2021

- Led small team to increase performance of multiple 2D and 3D computer-vision ML models more than 10X on custom hardware
- Designed architecture-specific, highly optimized convolution primitives

### Nvidia // Santa Clara, CA

#### Deep Learning Software Intern // May 2019 – Aug 2019

- Reduced ML model size up to 5x through in-compiler weights compression

### Uber // Pittsburgh, PA

#### Software Engineering Intern // May 2018 – Aug 2018

- Reduced autonomous vehicle safety response latency by more than 2x with new prototype distributed message passing architecture

### Carnegie Mellon University // Pittsburgh, PA

#### Research Assistant // Dec 2016 – May 2020

#### Teaching Assistant // Aug 2017 – May 2020

- Research in memory systems optimizations for sparse algorithms
- Taught and mentored hundreds of undergraduate and graduate students

## Select Projects

Detailed descriptions and more projects at: <https://williamliu.me/categories/project/>

### Improving CNN Interpretability // Course Project, May 2019

Algorithm that annotates how each layer in a CNN contributes to the output

### Parallel Galaxy Simulation // Course Project, May 2019

Galaxy simulation algorithm using parallel algorithms and data structures

### Modware // PennApps XVII Hackathon, Jan 2018

Built in 36 hours. Allow software engineers to prototype hardware systems  
**2nd Place, Hacker's Choice Award, Best Hardware Hack, and Best IoT Hack**

### Facebook Discourse // Facebook Global Hackathon Finals, Nov 2017

Built in 24 hours. Digitize and organize political debates in real time  
Presented to the VPs of Technology of Instagram, WhatsApp and Facebook  
**Grand Prize out of 14 finalists from 11 different countries**

## Select Publications

### "Accelerating Scientific Applications With SambaNova Reconfigurable Dataflow Architecture" *Computing in Science & Engineering*, 2021

M. Emani, V. Vishwanath, C. Adams, M. E. Papka, R. Stevens, L. Florescu, S. Jairath, **W. Liu**, T. Nama, and A. Sujeeth

### "What Your DRAM Power Models Are Not Telling You: Lessons from a Detailed Experimental Study" *SIGMETRICS* 2018.

S Ghose, A G Yağlıkçı, R Gupta, D Lee, K Kudrolli, **W X. Liu**, H Hassan, K K. Chang, N Chatterjee, A Agrawal, M O'Connor, O Mutlu.