

Tianyun Zhang

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EDUCATION

Carnegie Mellon University Aug 2023 - Expected 2028
Ph.D. Electrical and Computer Engineering

University of Illinois at Urbana-Champaign Aug 2020 - May 2023
B.S. Computer Science + Economics, minors in Applied Statistics, Mathematics GPA: 3.95/4.00

Relevant Coursework: Computer Architecture, Computer System Organization, System Programming, Numerical Optimization, Data Structures, Software Design, Machine Learning for Signal Processing, Natural Language Processing

PUBLICATIONS

T. Zhang, E. Tang, F. Siddique, K. Skadron, F. Franchetti, “Towards an End-to-End Processing-in-DRAM Acceleration of Spectral Library Search”, IEEE High Performance Extreme Computing Conference (HPEC), 2024, Extended abstract with poster presentation

RESEARCH INTERESTS

Investigations into hardware-software co-design for novel computer architectures and making data-centric hardware systems more accessible to programmers.

RESEARCH EXPERIENCE

Carnegie Mellon University Aug 2023 - Present
Advisor: Prof. Franz Franchetti
Graduate Research Assistant

- Exploring efficient filtering and computation with quantized low-precision representations for in-memory computing, focusing on applications in bioinformatics (mass spectrometry) and machine learning (numerical algorithms)
- Research supported in part by SRC JUMP 2.0 PRISM

ARCANA Research Group at University of Illinois Jan 2022 - May 2023
Advisor: Prof. Saugata Ghose
Undergraduate Researcher

- Researched programming models for processing-in-memory (PIM) applications, i.e. MapReduce algorithm on ReRAM

Gies College of Business at University of Illinois June 2021 - May 2022
Advisor: Prof. June-Young Kim
Research Assistant

- Automated financial transcript collection and cleaning; analyzed sentiment to assess impact on company performance

PROFESSIONAL EXPERIENCE

KQ Capital June 2023 - Aug 2023
Venture Capital Intern

- Performed market research and analysis to assess potential investments within the computer hardware industry
- Evaluated startup pitches, providing specialized insights into their technical innovations and market potential

Amazon May 2022 - Aug 2022
Software Development Engineer Intern

- Processed data and built interface of seller product applications for internal customers
- Accomplished technical stack migration to centralize rendering logic and decrease build time from minutes to seconds

BP June 2021 - Dec 2021
Digital Security AI Developer Intern

- Developed virtual assistant to monitor automation system remote access, improving service efficiency via usage stats
- Worked with Process Control Network (PCN) architecture using Azure DevOps CI/CD pipeline

PROJECTS

Neural Code Generation for Scientific Computing Kernels April 2025

- Investigated reasoning capabilities of LLMs (GPT-4o, Gemini 2.5 Pro) for generating BLAS, FFT, and NTT kernels
- Benchmarked correctness and performance against MKL, cuBLAS, FFTW, and rule-based SPIRAL generated libraries

Pittsburgh RAG March 2025

- Developed retrieval-augmented generation (RAG) for domain-specific QA with LangChain, comparing Llama, Qwen, and Gemma LLMs with Nomic and GTE embeddings; built custom web scraping tools (BeautifulSoup, Hyperbrowser)

LEADERSHIP AND TEACHING

Engineering Community Outreach

Jan 2024 - May 2024

Instructor

- Fostered connections between Carnegie Mellon and the Pittsburgh community by delivering STEM curriculum to K-12 students, e.g. introduction to microcontrollers
- Applied pedagogy and classroom management practices to create an engaging learning environment for students from mixed socioeconomic backgrounds and experiences with math, science, and coding

Women in CyberSecurity (WiCyS) at Illinois

Sept 2020 - May 2023

President

Jul 2022 - May 2023

- Led university chapter; bridged campus and national WiCyS to increase professional development and mentorship

Vice President

Aug 2021 - Jul 2022

- Established communication with 10+ companies and obtained WiCyS's first sponsorship funding from industry
- Organized technical workshop collaborations with corporate sponsors drawing over 60 members in attendance

Technical Chair

Sept 2020 - Aug 2021

- Planned and presented bi-monthly technical workshops for members, e.g. workshops introducing command line security challenges, cryptography, steganography
- Managed team creating top-down 2D game with JavaScript to teach K-12 students security

CS 433 Computer System Organization Staff

Jan 2023 - May 2023

Course Grader

- Aided development of homework and exam questions testing conceptual understanding of computer architecture
- Designed grading rubrics and prepared personalized feedback on assignments

CS 196 Freshman Honors Staff

Jan 2021 - Dec 2021

Project Manager

- Led 3 teams of 5 students on stock trend analysis, scheduling, and music preference web apps
- Created coding tutorials and weekly workstreams for team under scrum-based agile framework

CS 125 Introduction to Computer Science Staff

Jan 2021 - May 2021

Course Assistant

- Mentored students on Java coding homework and projects; led discussion-style tutorials

Illinois Business Consulting

Sept 2020 - May 2021

Consultant

- Advised insurance agency, identifying advantageous statistical and ML models to improve risk aggregation analysis
- Delivering insights through weekly PowerPoint presentations and created innovative Blender animations to symbolically visualize risk

SKILLS

Technical Skills: architectural simulation, performance modeling, memory systems, machine learning

Programming Languages: C, C++, Python (PyTorch), R, Java, Bash, C#, Kotlin, TypeScript

Languages: English (Native), Chinese (Native), French (Intermediate), German (Beginner)

HONORS

Carnegie Institute of Technology Dean's Fellow (CMU)

2023

Procter & Gamble Excellence in Leadership Award

2023

Women in CyberSecurity Conference Scholarship

2021, 2022

JP Morgan Chase Women in Computer Science Scholarship

2021

Gold Medalist, The National French Contest

2020

Violin Distinction, Associated Board of the Royal Schools of Music

2018

AFFILIATED ORGANIZATIONS

First Violinist, CMU All University Orchestra (AUO)

Member (Former Student Chapter President), Women in CyberSecurity (WiCyS)

Member, Association for Computing Machinery (ACM) SIGARCH

Member, Institute of Electrical and Electronics Engineers (IEEE)

Member, Society of Women Engineers (SWE)

Member, Phi Beta Kappa Society