YOUYOU WU

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Education

University of Illinois at Urbana-Champaign Expected May 2027
Bachelor of Science in Mathematics & Computer Science, GPA: 3.89/4.00

Chinese University of Hong Kong, Shenzhen Sep 2023 - May 2024
Completed first-year coursework toward B.Eng. in Computer Engineering

Related Coursework

- **Advanced Mathematics:** Graduate Real Analysis, Graduate Combinatorics, Semi-random Method in Combinatorics, Probabilistic Methods, Honors Abstract Algebra, Honors Real Analysis, Honors Linear Algebra, Graph Theory, Probability and Statistics
- **Computer Science:** Computational Geometry, Approximation Algorithm, undergraduate Algorithms, Data Structures, System Programming, Computer Architecture, Database systems, Numerical Methods, Discrete Structures
- **Specialized & Online:** Deep Learning for Computer Vision (UMich), Machine Learning (Coursera), Accelerated CS Fundamentals (Coursera)

Honors & Awards

Dean's List, College of Liberal Arts & Sciences (UIUC) Fall 2024, Fall 2025

Research Experience

Undergraduate Researcher at Illinois Mathematics Lab Jan 2026 - Present
UIUC *Champaign, IL*

- Investigating the open mathematical problem of enumerating border-strip decompositions on cylinders within a 4-person undergraduate research team under faculty and PhD mentorship.
- Formalizing the conjecture for the recursive formula of the decompositions and actively constructing rigorous mathematical proofs to verify its correctness.
- Developed and implemented a computational enumeration algorithm to generate structural data, facilitating the analysis of whether the resulting sequences arise in broader mathematical contexts.

Directed Reading Program on Limit Graph Theory under Bowen Li Aug 2025 - Dec 2025
UIUC *Champaign, IL*

- Conducted an in-depth study of Limit Graph Theory following *Large Networks and Graph Limits* by L. Lovász; synthesized concepts focusing on graph homomorphisms, graphons, convergence metrics, and applications including the Regularity and Removal Lemmas.
- Delivered weekly technical presentations to the mentor, deconstructing complex proofs and discussing the intuitions and applications behind theorems.
- Authored a comprehensive, self-contained set of expository notes in LaTeX, formalizing all definitions, theorems, and proofs covered throughout the program.

Undergraduate Research Assistant under Prof. Hanghang Tong Aug 2025 – Present
UIUC *Champaign, IL*

- Conducting literature review on knowledge conflict in LLMs and circuit-level interpretability to define evaluation protocols for research plan.
- Reproducing baseline results for conflict-sensitive evaluations and building a standardized harness (PyTorch/HF) with deterministic seeding, logging, and ablation switches to compare base vs. instruction-tuned models.
- Reproducing state-of-the-art baselines for conflict-sensitive evaluations for upcoming experiments.

Intelligent Schedule Manager, REU Project May 2025 – August 2025

Summer altREU *Remote*

- Led an REU project developing an open-source intelligent schedule manager; research results are currently being prepared for a peer-reviewed publication.
- Architected an end-to-end data pipeline to extract schedule information from 5+ sources (Canvas, Blackboard, PDFs) with 90%+ parsing accuracy.
- Implemented a Retrieval-Augmented Generation (RAG) system enabling natural language queries and automated reminders via a local LLM backend.
- Designed a local persistence layer using SQLite and FastAPI to ensure data security and offline functionality.

LLM Research Intern, advised by Song Luo April 2025 - August 2025

Lenovo *Remote*

- Engineered a privacy-first multimodal PC agent by deploying a local-run LLM, ensuring user data security and offline capability.
- Enabled context-aware task execution by implementing Model Context Protocol (MCP) servers including memory, screen understanding, and automated email/calendar management tools.
- Designed a streamlined user interface featuring multimodal inputs and instant hotkey activation, reducing multi-step workflows to single commands.

Teaching Experience

Undergraduate Algorithm and Data Structure Course Assistant Jan 2026 - Present

UIUC *Champaign, IL*

- Served as Course assistant for the undergraduate Algoritrhm and Data Structure class. Topics include Recursion, Big O, Divide and Conquer, Induction, Graph Algorithms, Dynamic Programming, Clustering, Sampling, Linear Programming, NP analysis.
- Developed and deployed homework problems to university online PrairieLearn platform.
- Led weekly lab sections and host office hours to help students understand concepts and assist with debugging.

Project Experience

Character-Specific TTS Model Fine-Tuning, at a CS RSO February 2025 – June 2025

UIUC *Champaign, IL*

- Developed a voice conversion agent capable of generating realistic, emotional, and character-specific speech from text and audio input.
- Conducted a comparative analysis of open-source TTS models to select the optimal architecture based on voice quality and latency metrics.
- Fine-tuned a zero-shot TTS model on a custom dataset to improve vocal clarity and character similarity.

Chip-8 Emulator in Rust | *Rust, Systems Programming*

- Implemented a Chip-8 emulator from scratch, handling all 35 base CPU opcodes, memory management, and rendering logic.

Technical Skills

- **Programming Languages:** Python, C++, Verilog, MIPS Assembly, C, Rust, R
- **AI/ML Frameworks:** PyTorch, Huggingface transformers, LangChain, Pandas, NumPy
- **Developer Tools:** Git, Docker, Linux
- **Developer skills:** Backend: Mysql, MongoDB, Neo4j, FastAPI, RESTful APIs; Frontend: Vue.js, PyQt, Streamlit, Gradio

Languages

- **Mandarin Chinese:** Fluent
- **English:** Proficient