Yongkang Cheng

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EDUCATION

University of Toronto (St. George), Toronto, ON Sep 2023 – May 2028 (expected)
BASc in Computer Engineering + PEY Co-op (cGPA: 3.87/4.0, Score: 88.6/100)
Relevant: Applied Deep Learning Fundamentals, Software Design & Communication

EXPERIENCES

Research Assistant, Spiking Neural Network FPGA Deployment Sep 2025 - Present
Research Intern, X-Lab, University of Toronto *Toronto, ON*
- Took over Verilog implementation of an SNN from a teammate; verified modules with ModelSim testbenches.
- Prototyping FPGA deployment flow with Vivado, validated initial design on Nexys board, preparing SNN integration.

Frontend Manager, Voluntrack.org May 2024 – Present
Volunteer, Non-profit | React, Firebase *Toronto, ON*
- Led a 4-person team to redesign the React frontend; improved task completion and engagement by 20%.
- Built fuzzy search and filtering over Firebase data; streamlined workflows and simplified onboarding.

Research Assistant, Ultra-Wideband Receiver Design May 2025 - Jul 2025
Research Intern, X-Lab, University of Toronto *Toronto, ON*
- Collaborated in a 2-person team, verified a hybrid 4-PPM + 8-PSK TX chip pre-tapeout; built Python/Simulink pipelines for 2 ns symbol sync and carrier recovery under discontinuous 4.6 GHz.
- Built pulse-position detection and K-means phase calibration for constellation stabilization and PPM demodulation.
- Achieved error-free demodulation across 2,500 symbols under $\geq 16\,$dB SNR (AWGN) and $\pi/16$ phase jitter.
- Presented at Undergraduate Engineering Research Day with a poster and an interactive demo, engaged 50+ attendees.

PROJECTS

Handwritten Text Recognition (CRNN) Jun 2024 – Aug 2024
Course Project | PyTorch, Python
- Trained a CRNN achieving **87%** word- and **95%** char-level accuracy on **10k+** samples.
- Implemented connected-component word segmentation; **1024 x 1024** inference in **<4s** on CPU.

City Mapify – Interactive Mapping Engine Jan 2025 – Apr 2025
Course Project | C++, OpenStreetMap
- Built C++ mapping engine parsing **2GB** OpenStreetMap data with QuadTree indexing at 60 FPS.
- Implemented A*/Dijkstra pathfinding and delivery optimization (Simulated Annealing, ACO) for **250+** packages.

Self-Hosted Chatbot with Diary DB Oct 2024
Personal Project | React, FastAPI, Nginx, NoSQL
- Deployed full-stack chatbot replicating personal style; TLS, DDNS, and reverse proxy for secure access.
- Integrated OpenAI API and vector search for context-aware Q&A over personal diaries.

SKILLS

- **Languages:** Python, C/C++, JavaScript, Node.js, Java, Verilog, Assembly, MATLAB/Simulink
- **Web/Backend:** FastAPI, Flask, React, REST, Docker, Nginx, SQL/NoSQL
- **ML/Data:** PyTorch, NumPy, OpenCV, Pandas; basic LangChain
- **Tools:** Linux, Git, SSH, Firebase, Raspberry Pi, 3D Printing, STM32, Altium Designer

AWARDS

- **University of Toronto Excellence Award (UTEA)** Apr 2025
  $7,500 scholarship for 6 students among 2nd to 4th ECE for research potential.
- **ECE Awards** Sep 2024
  Awarded to top 30 students in the first-year ECE program out of 300+ students.