Yongkang Cheng

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EDUCATION

University of Toronto (St. George Campus), Toronto, ON Sep 2023 - May 2028 (expected)
Bachelor of Applied Science in Computer Engineering + PEY Co-op (cGPA: 3.87/4.0)
Relevant Courses: Applied Fundamentals of Deep Learning, Software Design and Communication

TECHNICAL SKILLS

- **Programming:** Python, C/C++, Node.js, Java, JavaScript, TypeScript
- **Web & Backend:** React, FastAPI, Node.js, Nginx, Docker, SQL/NoSQL, RESTful APIs
- **AI & Data:** PyTorch, LangChain, NumPy, Pandas, Matplotlib, OpenAI API
- **Tools & Platforms:** Git, SSH, Linux, Firebase, libcurl, OpenMP, Streamlit, Flask

EXPERIENCE

Frontend Manager, Voluntrack.org (Non-Profit) *React, Figma, MS Project* May 2024 - Present
Volunteer, Voluntrack.org *Remote*

- Led a 4-person team to redesign the web interface using React.js, improving user engagement by 20%.
- Designed UI in Figma and managed tasks with GitHub Project.
- Integrated Firebase for secure volunteer data storage and real-time search, allowing fuzzy search and filtering.

Research Assistant, Ultra-Wideband Receiver Design (University of Toronto) Jun 2025 - Jul 2025
Research Intern, X-Lab, University of Toronto *Toronto, ON*

- Built Python/Simulink pipelines for 2ns symbol sync and carrier recovery under discontinuous 4GHz.
- Developed pulse-position detection and K-means cluster calibration algorithms to mitigate timing shifts.
- Presented at Undergraduate Engineering Research Day with an interactive hybrid-modulation demo site.

PROJECTS

UTEK Wildfire Disaster Communication System Jan 2025

- **Top 8 Finalist** in University of Toronto Engineering Competition (UTEK) among all competing teams.
- Built real-time communication platform with Python, Streamlit, and Flask for wildfire emergency response coordination.
- Implemented interactive map interface using Folium for visualizing fire incidents and location-based alerts.
- Developed bidirectional communication system between residents and rescue teams with photo upload capabilities.
- Created severity classification system with automated risk assessment for intelligent resource allocation.

City Mapify – Interactive City Mapping Application (University of Toronto) Jan 2025 - Apr 2025

- Developed a high-performance mapping engine in C++ to process OpenStreetMap data and render city maps.
- Designed efficient spatial data structures (**quadtrees**) for dynamic querying and smooth zoom-based rendering.
- Implemented advanced pathfinding algorithms (**Dijkstra, A*, Simulated Annealing**) for route planning and delivery optimization.
- Enhanced performance with multithreading (OpenMP) and RESTful API integration (libcurl).

Project Lead, Handwritten Text Recognition (University of Toronto) Jun 2024 - Aug 2024

- Led a remote team to develop a PyTorch-based CRNN model for handwritten text recognition.
- Achieved 87% word-level and 95% character-level accuracy on the test set with 10,000+ samples.
- Deployed connected-pixel algorithms for word positioning and word segmentation, processing 1024×1024 images in less than 4 seconds.

Self-Clone Chatbot with Diary Database Oct 2024 - Present

- Built a self-hosted AI-powered chatbot that replicates personal interaction styles, deployed using React.js, FastAPI, and Nginx on a Raspberry Pi.
- Integrated OpenAI API and a NoSQL database for real-time Q&A functionality with personal diary data.

- Ensured secure and seamless remote access by implementing TLS encryption, DDNS, and optimizing for daily traffic.

Diary with AI Feedback Sep 2023 – On Going

- Designed and implemented a journaling program integrated with OpenAI's GPT API, generating insightful feedback for over 750 diary entries.
- Developed a diary sorting algorithm to retrieve contextually similar past entries by vector search, maintaining API costs below $0.2 per call.
- Optimized data-sorting pipelines and API request processes, reducing average diary load time from 10s to 0.5s.

WillPower | Time Management & Monitoring Jan 2025 - Present

- Built a modular system with Raspberry Pi capturing images and sending them to a Windows host for local storage and analysis.
- Deployed Nginx, FastAPI, and libcurl for data transfer, facilitating real-time user monitoring and minimal downtime.
- Currently exploring Azure Face APIs and transfer learning for user-behavior analysis on a dataset of over 180,000 images.

Acorn Course Timetable Monitor Crawler Personal Project

- Built automated Python web crawler to monitor University of Toronto's Acorn course timetable system for real-time changes.
- Implemented intelligent change detection algorithms with robust error handling and automatic recovery mechanisms.
- Developed notification system for course availability updates, helping students secure spots in full courses.

AWARDS & ACCOMPLISHMENTS

University of Toronto Excellence Award (UTEA) Apr 2025

- Awarded UTEA for top academic performance and research potential.
- Received $7,500 scholarship for research excellence and inclusion.

ECE Awards & Dean's List Scholar (UofT) Sep 2024

- Recognized for outstanding academic performance.