Wei-En (Wayne) Tsai

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Education

University of Washington
M.S. in Technology Innovation (Computer Science), College of Engineering. *Sep. 2024 - Mar. 2026*

National Tsing Hua University
M.S. in Information Security. GPA:4.2/4.3 (Withdrew to pursue graduate studies in the U.S.) *Sep. 2021 - Jun. 2023*
B.A. in Computer Science and Quantitative Finance. Last 60 GPA:3.86/4.3 *Sep. 2017 - Jun. 2021*

Experience

T-Mobile *Seattle, WA* Sep. 2025 - Mar. 2026
Software Engineer (Industry-Sponsored Capstone)

- Built an intent-based traffic detection system using **Python**, **NFStream/nDPI** deep packet inspection, and a custom 600+ application mapping layer to classify real-time flows into latency-priority tiers, triggering automated WAN switching via **pfSense REST API** in under 2 seconds.
- Developed a full-stack monitoring suite spanning packet capture and DPI classification to a **React/Ink** terminal UI and **Node.js** backend, enabling real-time 5G network slice selection for latency-sensitive workloads on commodity home router hardware.

Dareesoft *Seattle, WA* Jul. 2025 - Sep. 2025
Software Engineer (Internship)

- Architected a scalable **MLOps orchestration layer** on Kubernetes, managing the lifecycle of distributed AI models via Ray and MLflow to accelerate the 0→1 deployment of hazard detection agents.
- Implemented **Infrastructure as Code (IaC)** using **Terraform** to automate cloud resource provisioning and manage infrastructure lifecycle for ML workloads.
- Optimized GPU-accelerated rendering pipeline using **Deck.gl**, reducing render latency by 60% and maximizing hardware resource utilization for large-scale hazard mapping.

De.Vote Inc. *Hsinchu, Taiwan* Aug. 2022 - Aug. 2024
Backend Engineer, Founder (Part-time, during MS studies)

- Architected a secure, event-driven voting system handling **500+ TPS**; implemented **cryptographic verification** and **PII compliance protocols**, ensuring **data integrity** for high-stakes elections. Granted a **patent** for the system.

Aisen Technology Co., Ltd. *Hsinchu, Taiwan* Jul. 2019 - Aug. 2024
Full Stack Engineer, Founder (Part-time, during undergraduate studies)

- Developed a full-stack eye-tracking communication aid for Parkinson's patients leveraging **WebGazer.js**, **React**, **Node.js**, **MongoDB**, and **AWS** for cloud infrastructure, reducing application costs by 99% using webcam+ML to replace dedicated eye-tracker.
- Engineered a **GenAI-driven agent** leveraging Claude API to interpret unstructured patient input, utilizing **prompt engineering** to generate context-aware communication aids for users with motor impairments.

Advantech Co., Ltd. *Taipei, Taiwan* Jul. 2019 - Aug. 2019
Software Engineer (Internship, Awarded Best Intern)

- Built and deployed a vulnerability scanner web app (**Flask**, **MongoDB**) with **Kubernetes** orchestration and **Jenkins** CI/CD, enabling seamless deployment to SaaS marketplace; identified and resolved critical security vulnerabilities, reducing potential data breach risk by 25%.

Publication & Patent

The ACM Symposium on User Interface Software and Technology (UIST) *SF, US* Oct. 2023
*Aisen - Web-Based Gaze-Tracking Assistive Communication Interface with Word Cards Generated by **LLMs***

The 33rd VLSI Design / CAD Symposium *Taipei, Taiwan* Aug. 2022
*iWalkSafe - Wearable Navigation Assistance for the Visually Impaired Based on **Miniaturized Edge AI***

Method and System for Proxy Voting *Taiwan Intellectual Property Office* Sep. 2023
***Primary Inventor** of an efficient, user-centric and privacy-enhanced proxy voting method.* *Granted ID: 112210061*

College Student Research Scholarship *Ministry of Science and Technology, Taiwan* Jul. 2020 - Feb. 2021
How does innovation matter? A firm-level analysis using textual-information in patent documents

Selected Projects

idLab eID: Practical eID Solution for Schools and Enterprises *NTHU* Sep. 2020 - Aug. 2021

- Single-handedly engineered a scalable eID system for NTHU, utilizing a distributed architecture with **Amazon SQS** for message queuing and **WebSocket** for real-time identity verification updates.
- Awarded $4,760 USD university innovation grant for delivering a production-grade identity management system serving administrative and academic workflows.

iWalkSafe: Wearable Navigation Assistance for the Visually Impaired Sep. 2021 - Mar. 2022

- Developed a wearable navigation system using **Edge AI** and **computer vision** for real-time environmental hazard detection, improving pedestrian safety for visually impaired users on a miniaturized embedded platform.
- Led a 3-person team; secured $1,575 USD in research grants and published findings as **first author** at the 33rd VLSI Design/CAD Symposium (2022).

Research Experience

Department of Quantitative Finance, National Tsing Hua University Jul. 2019 - Jan. 2024

Part-time Research Assistant, Supervisor: Prof. Wan-Chien Chiu *Hsinchu, Taiwan*

- Developed **data pipelines** with **Python** and **BeautifulSoup** for large-scale web scraping, enabling **sentiment analysis** on financial texts.
- Implemented **parallel programming** and proxy switching for efficient data collection and **topic modeling using LDA**.
- Engineered a real-time pipeline observability layer with push-notification alerting for long-running ML training jobs and large-scale data collection runs, eliminating manual progress polling.

Service Science Institute, National Tsing Hua University Apr. 2023 - Aug. 2023

Part-time Research Assistant, Supervisor: Prof. Patricia Pei-Yi Kuo *Hsinchu, Taiwan*

- Developed a **real-time health data visualization platform**, harmonizing sensor streams from wearable devices to provide actionable clinical insights for non-technical researchers.
- Developed a low-code backend with **Node.js** and **PostgreSQL** for non-technical researchers to manage ML experiments.

Office of Interdisciplinary Research, National Tsing Hua University Jul. 2021 - Aug. 2021

Full-time Research Assistant, Supervisor: Prof. Po-Hsuan Hsu *Hsinchu, Taiwan*

- Applied **NLP** and entity recognition to extract trademarks from product names, enhancing patent analysis with **text similarity analysis**.
- Implemented **parallel programming** techniques to process large-scale patent corpora, reducing analysis runtime for deep learning model training pipelines.

Selected Awards

Cybersecurity Talent Incubation Program *Ministry of Education, Taiwan* Oct. 2017 - Sep. 2021

Top 1% National Cybersecurity Talent

- Researched **router vulnerability exploitation**, building **deep learning** models for network traffic anomaly detection.
- Excelled in advanced **CTF** challenges, leveraging machine learning for automated vulnerability analysis.

Outstanding Student Scholarship *LCY Education Foundation* Nov. 2022

Recognized for academic excellence and leadership in tech-driven projects

Skills

Programming Languages: Python, Ruby, C/C++, JavaScript, Shell Script, Java, Go, Swift
Databases: MongoDB, PostgreSQL, MySQL, Redis, SQLite
Frameworks: Ruby on Rails, Flask, React, Node.js, Spring Boot, SwiftUI
ML Tools: PyTorch, TensorFlow, MLflow, Ray AI (Ray Serve, Ray Workflows, Ray Train/Tune), Evidently
DevOps & Infrastructure: Git, Docker, Kubernetes, Jenkins, GitHub Actions, Terraform, Ansible, Grafana, AWS, GCP, Azure, Proxmox
Related Courses: Software Studio (A+), The Attack and Defense of Computers (A+), Linux Operating System Kernel (A+), Network Security (A+), Service-Oriented Architecture (A+), Intro to Embedded System (A-), Intro to IoT (A-)