Andrew Wu

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Education

McMaster University *Hamilton, Ontario*
B. Eng in Software Engineering *May 2029*

Experience

McMaster Artificial Intelligence Society | *Software Developer* Oct 2025 – present
- Built a weighted hybrid **FFT–ViT–CNN** deepfake detection model, integrated into a **Next.js + FastAPI** web application, achieving **85% test accuracy**
- Integrated async model serving, batch processing, and GPU-accelerated inference to optimize latency and throughput
- Deployed ML inference pipeline with **Docker** and **Kubernetes**, leveraging **NGNIX load balancing** and **Redis caching** on cloud infrastructure

Google Developer Groups | *Open Source Developer* Sept 2025 – present
- Designed an AI-powered browser automation agent using **LangGraph** and **LLM-based reasoning** to orchestrate multi-step reasoning and tool use for dynamic webpage interaction
- Integrated **Playwright** to execute DOM actions into DOM-state embedding pipeline, increasing UI-interaction reliability by **30%** across non-responsive webpages and SPA's
- Developed real-time reasoning logging with **FastAPI** and **WebSockets** for debugging and interpretability of agent actions

McMaster Exoskeleton | *Software Developer* Sept 2025 – present
- Developed and integrated an **LSTM**-based gait prediction algorithm with **PyTorch**, achieving **85% accuracy** ($\pm 5°$) in estimating joint angles from IMU sensor data
- Optimized model generalization through diverse training data, allowing adaptation to varied gait patterns.

McMaster Solar Car Project | *Full Stack Developer* Sept 2025 – present
- Designed and deployed **LGTM** stack (Loki, Grafana, Tempo, Mimir) to monitor operations and track **OpenTelemetry** metrics and logs through profiled **Docker** containers and integrated with **GitHub Actions CI/CD**
- Implemented robust error handling via **FastAPI** and **Jinja2**, improving platform reliability

Projects

NewKnew Sept 2025
- Developed GPT-4-powered news platform, delivering concise insights on trending tech articles
- Implemented **Express/Node.js** backend with a **PostgreSQL** database, optimizing query performance and clustering articles via **k-means**, displayed through a responsive **Next.js** frontend for personalized feeds and live topic updates
- Automated data pipeline in **Python** to scrape and preprocess **500+** articles, reducing manual curation time by **90%**

Restaurant Location Optimization Nov 2024
- Designed a profit-maximization model with **NumPy** using a non-linear cost function and implemented a gradient descent algorithm to converge on optimal restaurant coordinates
- Addressed model limitations by integrating non-Euclidean geometric constraints, increasing accuracy by **70%**

Wilberforce Pendulum Simulation Feb 2025
- Built a computational physics simulation solving nonlinear differential equations to model pendulum motion
- Designed data visualization pipeline with **Matplotlib**, producing clear insights on oscillatory and rotational dynamics

Skills

Languages: Python, SQL, Java, JavaScript, TypeScript, HTML/CSS

Technologies/Frameworks: PyTorch, HuggingFace, LangGraph, PostgreSQL, MySQL, Redis, Docker, Kubernetes, NGNIX, Grafana, Prometheus, WebSockets, Git, Agile Development

Libraries: OpenCV, TeseractOCR, FastAPI, Pydantic, scikit-learn, Matplotlib, NumPy, Pandas