Patrick Maxiao Ma

Waterloo, ON, Canada — +1 (437) 818-0920 — maxiaoma833@gmail.com — LinkedIn Profile Link,—, Portfolio

Education

University of Waterloo, Waterloo, ON *2024-2029*
Bachelor of Computer Science (Co-op Program)
Average: 91.3

Work Experience

Full Stack Developer Intern *May 2025 – Aug 2025*
SparkLease, North York, Canada
Web: https://www.sparklease.com/

- Rebuilt PC and mobile frontends using **Razor (ASP.NET MVC)**, delivering 8 key pages and 10+ supporting pages with improved responsiveness and user experience.
- Led **SEO optimization**: redesigned URL structures, metadata, and sitemap configurations to enhance crawlability and indexing efficiency, achieving a **20%** increase in organic search traffic click-through rate.
- Integrated vehicle data from third-party APIs and implemented **C#/SQL** backend logic for accurate, real-time price estimation and personalized vehicle recommendations within 0.2s response time.
- Built CRON-triggered **Azure WebJobs** for daily asset audits and monthly vehicle-data refresh, adding structured logging and monitoring to ensure accurate, consistent, and automated data maintenance.

Machine Learning Intern *Jun 2024 – Aug 2024*
NanoInsights, Beijing, China
Official Web: https://www.naxi-tech.com/

- Supported training and optimization of **GAN**-based super-resolution models for electron microscopy using **Python, PyTorch, TensorFlow**, improving structural fidelity and achieving a **5% PSNR gain**.
- Developed automated data preprocessing scripts for segmentation, normalization, and quality filtering, integrating augmentation and automatic sampling to expand dataset coverage.

Project

SEO Agent (AI-powered Website Optimizer) *Jun 2025 – Present*
Web: github.com/PPAT132/SEOAgent

- Developed a full-stack **SEO optimization agent** using **Python (FastAPI)**, **Gemini API**, and **Docker**, enabling automated **HTML auditing, metadata analysis, and SEO rule enforcement**.
- Designed a structured **agent pipeline** that orchestrates data fetching, analysis, patch generation, and validation, with integrated diff previews and rollback support for safe, traceable fixes.
- Built an interactive **React** front end to easily test optimization results and preview verified changes.
- Achieved **SEO scores above 90** on Lighthouse audits with an average time of **30 seconds per page**.
- Currently extending into a VS Code plugin for repository access and seamless optimization workflow.

Super-Resolution AI Models for Microscopy *Aug 2024 – Aug 2024*

- Developed RCAN and U-Net (CNN based AI models) for microscopy image super-resolution using **Pytorch**
- Searched publicly available microscopy datasets and wrote **Python** scripts to preprocess the data. Expanded the original dataset of 10,000 images to 10 million samples through data augmentation techniques.
- **Achieved a 23% improvement** in image resolution compared to the original low-resolution images.

iGEM Competition (Silver Medal) Team Leader *Mar 2023 – Oct 2023*
Wiki: 2023.igem.wiki/bfsu-icunited/index.html

- Developed a responsive website with **HTML/CSS** and interactive features using **TypeScript**, and built a **Python (Flask)** backend to manage dynamic content updates.
- Managed overall project timelines, task assignments, and lab experiment coordination across a **21-member** interdisciplinary team, improving workflow efficiency through structured planning and hybrid collaboration.

Skills

- **Programming Languages:** Java, Python, C, C++, C#, JavaScript, TypeScript, Racket, Scala
- **Frameworks/Backend:** React, Razor, ASP.NET Core, Node.js, Flask
- **Machine Learning/AI:** PyTorch, TensorFlow, CNNs, data preprocessing, supervised training, AI agent development
- **Tools/Systems:** Docker, Azure, SQL, Linux