Patrick Maxiao Ma

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

Education

University of Waterloo, Waterloo, ON   *2024-2029*
Bachelor of Computer Science (Co-op Program)
Average: 91.2

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 and metadata for improved crawlability and indexing, increasing website search traffic click-through rate by **20%**.
- Designed and implemented a complete backend workflow with **C# and SQL**: ingested raw vehicle data into structured databases, developed algorithms to support features such as vehicle–trim selection and MSRP calculation, and ensured reliable frontend integration.
- Built scheduled jobs with **WebJob** for automated maintenance: daily tasks (e.g., missing image detection and updates) and monthly tasks (e.g., vehicle information refresh), keeping data accurate and up to date.

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

- Built and trained **GAN**-based super-resolution models for electron microscopy imaging using **Python, PyTorch, TensorFlow**, improving structural detail and achieving a **5% PSNR increase**.
- Designed an automated **data preprocessing pipeline** (segmentation, normalization, augmentation) to ensure high-quality training inputs and expand dataset coverage.

Project

SEO Agent (AI-powered Website Optimizer, VS Code Plugin)   *Jun 2025 – Present*

- Delivered a repository-aware **VS Code** extension: runs audits, pinpoints issues to exact files/lines, previews **HTML/CSS/metadata** patches, and applies verified fixes; supports batch runs and site-wide policies.
- Built an agent platform with **Gemini API** and structured **tool/function calling**: `fetch_url`, `run_lighthouse`, `extract_metadata`, `generate_patch`, `apply_patch`, `validate_url_rules`.
- Implemented full stack: **Python (FastAPI)**, **Docker**, **React**. Added local crawling and URL/robots/sitemap checks; produced actionable **diff/patch** flows with review gates and rollback.
- Indexed repositories for context-aware fixes (symbol map + HTML/templating resolvers), enabling accurate patching for Razor/React templating and static assets.
- Trained a lightweight SEO-tuned model to auto-suggest page-level improvements.

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

- **Software developing:** Java, Python, C++, C#, JavaScript, HTML, Racket, React, Razor, MySQL, Node.js, Linux
- **Machine Learning / AI:** PyTorch, Tensorflow, CNN