Michael Liu

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Education

University of Waterloo   *Sept 2025 - Apr 2030*
BMath in Mathematics

○ Major Average: 94% — Cumulative Average: 93%
○ Activities: Varsity Cross-Country, Varsity Track, WAT-ai (Artificial Intelligence) Design Team

Bill Crothers Secondary School   *Aug 2021 - Jun 2025*
Ontario Secondary School Diploma

○ Graduated 2nd in Class of 2025 with 99.17% Top 6 Grade 12 Average
○ Awards: Academic Accomplishment Award, Excellence in Mathematics Award, 8x University of Waterloo Mathematics Contest School Champion

Technical Skills

Programming Languages:	Python, SQL, C
Data/ML:	PyTorch, scikit-learn, Pandas, NumPy, Matplotlib
Databases/Tools:	PostgreSQL, MySQL; Git, GitHub; Jupyter Notebook, VS Code; Excel, Tableau

Job Experience

Machine Learning Engineer   *Waterloo, ON*
WAT.ai (University of Waterloo Artificial Intelligence Design Team)   *Sept 2025 - Present*

○ Worked on an applied medical imaging project focused on diabetic retinopathy with a small team of students.
○ Led dataset curation, preprocessing, and experiment organization.
○ Currently co-authoring a research paper titled "CNN vs. ViT-based U-Nets for Diabetic Retinopathy Lesion Segmentation".

Tennis Instructor & Tennis Racquet Stringer   *Markham/Unionville, ON*
Unionville Tennis Club/Premier Racquet Clubs Markham   *Apr 2022 - Aug 2025*

○ TPA (Tennis Professionals Association) Certified Instructor.
○ Over 500 hours of on-court instruction across 4 summers leading group camps and private hitting sessions for athletes of varying ages and skill levels.
○ Built a personal racquet-stringing service for local tennis players from my basement.

Projects

Fundus Diabetic Retinopathy Lesion Segmentation @ WAT.ai   *github/fundus-image-segmentation* ↗

○ Built a PyTorch data pipeline with image-mask augmentations for IDRiD and DDR fundus datasets.
○ Designed and trained Swin-UNet and CMAC-Net models for multi-class lesion segmentation.
○ Wrote task-specific loss functions (Focal Tversky) to address class imbalance.
○ Led ablation study on input resolutions and loss function choice.
○ Evaluated models using class-wise and mean F1, IoU, and Recall.

Tennis Stroke Multi-Class Classification   *github/tennis-stroke-classification* ↗

○ Built image classification models to identify tennis strokes from still images.
○ Trained and compared pretrained CNNs (ResNet-18, MobileNetV3, ConvNeXt-Tiny).
○ Applied Grad-CAM visualizations to interpret model attention.
○ Deployed models on a Streamlit application.