Matthew Lam

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TECHNICAL SKILLS

Languages: Python, C, C++, JavaScript, TypeScript, Shell Script, SQL, HTML/CSS
Frameworks: TensorFlow/Keras, PyTorch, FastAPI, Node.js, REST APIs
Tools: AWS (S3, Lambda, EC2), LocalStack, Docker, GitHub Actions (CI/CD), VS Code, Hugging Face, Kubernetes

PROFESSIONAL EXPERIENCE

AI Engineer (Graduate Research) — Aug 2023 – Present
Maternal Fetal Imaging (MFI) Lab, Toronto Metropolitan University (TMU)
Automatic Triage Diagnosis Algorithm | PyTorch
- Led development of **EndoAI**, a deep-learning system for endometrial cancer diagnosis on gigapixel whole-slide images (WSI).
- Designed **ML workflows** to improve model performance while maintaining inference efficiency and scalability
- Achieved a **AUC improvement of 4–5%** over standard MIL baselines across benign vs. non-benign and subclassification tasks without pathologist annotations.
- Developed a full **preprocessing and training pipeline**, including data intake, tissue detection, feature extraction, slide-level classification and model inference.
- Submitted to peer-reviewed medical imaging conference.

Digital Pathology Web Platform | Cloud Object-Storage
- Implemented key components of a full-stack web platform for AI-assisted histopathology diagnosis, integrating **Node.js/TypeScript services with Python ML pipelines**.
- Developed the **end-to-end multi-model inference pipeline** that executes five pretrained pathology models on each uploaded slide and delivers class predictions with confidence scores.
- Designed and implemented **RESTful APIs (FastAPI)** to expose ML model inference results to downstream services and user interfaces
- Built an interactive **image viewer** and heatmap overlays with annotations

Engineering Teaching Assistant — Aug 2023 – Aug 2025
Signals and Systems I, Introduction to Software & Human Comp. Interactions, Toronto Metropolitan University (TMU)
- Mentored 20+ students software engineering, covering MATLAB signal processing, C/C++ object-oriented design, system modeling, testing, and user-centered interface development.

Undergrad Internship: AI Engineer — Sept 2022 – Jul 2023
Maternal Fetal Imaging Lab, Toronto Metropolitan University (TMU)
- Implemented a preprocessing step that subdivides images of cancer cells
- Collaborated closely with researchers and a supervising professor to refine methodology and validate results

ACADEMIC CREDENTIALS

Toronto Metropolitan University
Masters of Applied Science, Biomedical Engineering, Dean's List Honours   *CGPA: 4.0/4.0*   Aug 2023 – Dec 2025
- *Thesis*: Web-Integrated AI Platform for Endometrial Biopsy Pathology Classification Using Multiple Instance Learning

Bachelor of Engineering, Biomedical Engineering, Dean's List Honours   *CGPA: 3.7/4.0*   Aug 2019 – Aug 2023

PROJECTS

Improving Segmentation in Colorectal Cancer: A Deep Learning Approach
Enhancing Polyp Segmentation in Colorectal Cancer using Attention U-Net Model — Dec 2024
- Built a **full segmentation pipeline** including data preprocessing, augmentation, model training, evaluation metrics, and visualization.
- Evaluated deep learning architectures (U-Net, R2U-Net, Attention U-Net) for polyp segmentation using the **Kvasir-SEG dataset**, achieving **Dice of 71.363%** with the attention-enhanced model.

CONFERENCE SUBMISSION

ObGyn: EndoPathAI: A Web-Based AI Platform for Automated Endometrial Biopsy Analysis   2025
GT x ImNO Joint Symposium: Designing an Endometrial Pathology Slide Classification User Interface   2025
ObGyn: Classification of Endometrial Greyscale Pathology Slide   2024