Akathian Santhakumar

MSc. Computer Science | HBSc. Computer Science and Neuroscience

akathian.com github.com/Akathian linkedin.com/in/akathian (647) 882-7285 asanthakumar@torontomu.ca

Software Engineer & Machine Learning Researcher with **over 5 years of experience** building explainable AI, scalable ML pipelines, and full-stack applications. Skilled in Python, PyTorch/TensorFlow, cloud deployment, and RAG/LLM systems. Experienced in both academic research and industry productization across healthcare, fintech, and VFX.

Key Competencies

Programming	Python, TypeScript, JavaScript, Java, Matlab, R, C, Shell Scripting, Bash
Artificial Intelligence	**Frameworks** (PyTorch, Tensorflow, Keras, NumPy, Scikit, Gensim), **ML-Ops** (Docker, AWS Sagemaker), ML/DL Algorithms
Engineering	**Backend** (Node.js, Django, Flask), **Database** (MySQL, NoSQL), **Frontend** (Angular, React), **Infrastructure** (Docker, Apache Airflow, Redis, SonarQube, Kubernetes, Prometheus, Grafana), **Cloud** (GCP, AWS)

Education

2022-2025 Master of Science (MSc) in Computer Science, Toronto Metropolitan University

Thesis: *Explainable Early Detection of Acromegaly via Longitudinal Attention Based Imaging Models*

- Developed a deep learning, xAI framework using longitudinal images, while controlling for age effects

Other research areas:

- Retrieval-Augmented Generation (RAG, LLM) systems for Electronic Health Record (EMR) summarization
- Multi-modal models for acromegaly diagnosis and subdural hematoma remission

2017-2022 Honors Bachelor of Science (HBSc) in Computer Science and Neuroscience, University of Toronto

Thesis: *A Neural Network Model of Visual Word Recognition*

Experience

Sep 2022 - Present Graduate Teaching Assistant, Toronto Metropolitan University, Toronto ON

- Led labs and tutorials across 5 undergraduate CS courses (Python, Data Structures, Programming Fundamentals), supporting 400+ students and grading assignments & exams

Jan 2022 - May 2023 Machine Learning Engineer, MARZ VFX, Toronto ON

Engineering ML apps, data pipelines, ML models and supporting ML infrastructure for VFX tasks

- Spearheaded system design meetings for LipDub AI and Vanity AI facilitating Hollywood-grade automated lip-syncing and facilitating high-quality VFX enhancements
- Sped up data pipelines 300x by optimizing db calls, model compilation and general code quality
- Built an end-to-end ML web-app for eye bags, acne and de-aging edits that meet Hollywood standards reducing artist editing time by 90%

Sep 2021 - Apr 2023 Deep Learning Research Programmer, University of Toronto Department of Psychology, Toronto ON

Developed neural network models of how humans produce, comprehend, and understand language

- Rebuilt the CLens neural network simulator in Python, enabling reproducibility and extensibility for future projects
- Analyzed and interpreted results of neurological computational models of language processing to evaluate performance and how well the model has simulated neurological systems

Sep 2021 - Dec 2021 Machine Learning Engineer, 16Bit, Toronto ON

Engineered neural networks to infer BMD from x-ray images and survival predictions in COVID-19 patients

- Researched and implemented DeepHit, COX, XGBoost, and DeepSurvivalMachine algorithms to COVID-19 patient data to predict clinical outcomes
- Built a pipeline to run multiple experiments to obtain the model that could predict risk score the best

Jan 2021 - Aug 2021 Software Developer, BioRender, Toronto ON

Focused on features, APIs and the database before working on user recommendations, A/B tests and data

- Designed and A/B tested a scoring function for 6k+ users and built classification/clustering algorithms to recommend templates most relevant to user illustrations
- Implemented the Flagsmith A/B testing platform, enabling 25+ developers and PMs to experiment with new features safely and evaluate impact on key metrics

Sep 2019 - Aug 2020 Innovation Engineer (R&D Application Developer), CIBC, Toronto ON

Prototyped a digital assistant by researching and implementing frontend, backend & infrastructure tech

- Built and trained a multimodal neural network that predicts user sentiment from gestures, facial expressions, and speech, enabling adaptive digital assistant responses