ARUSHNA BALAGANESH

(647) 355-0400 | arushna27@gmail.com| linkedin.com/in/arushna-balaganesh | github.com/arushnab

EDUCATION

UNIVERSITY OF TORONTO September 2023 - April 2028

Bachelor of Applied Science in Computer Engineering & PEY Co-op, Artificial Intelligence Minor

Relevant Coursework: Data Structures & Algorithms; Software Design; Signal Processing; Linear Algebra; Computer Systems

EXPERIENCE

KREMBIL RESEARCH INSTITUTE Toronto, ON

Research Assistant May 2025 - Present

- Developed **end-to-end ML pipelines** for neurological signal modeling in **Python**, improving experiment reliability and achieving **>90% accuracy** on classification tasks
- Built a **modular evaluation system** with automated metrics (F1, ROC-AUC, confusion matrices), reducing manual analysis time **~50%** and enforcing reproducibility across experiments
- Designed and trained a **Vision Transformer (ViT) pipeline** for chirp-spectrogram classification in **PyTorch**, automating spectral preprocessing and scaling the workflow to process **5,000+ signal windows** with stable training behavior

NEUROTECHUOFT Toronto, ON

Machine Learning Engineer September 2025 - Present

- Evaluated **deep learning architectures** (CNNs, LSTMs, transformers) on EEG+accelerometer data from 25 Parkinson's patients to detect tremor and motor states
- Developed **multimodal data processing workflows** (windowing, synchronization, artifact inspection) to improve signal quality and support exploratory deep learning evaluation
- Analyzed optimization methods **(quantization, pruning)** for **INT8 inference**, assessing tradeoffs of **1–2% accuracy loss** while targeting **>80% classification accuracy** in embedded systems

PROJECTS

SAFEROUTE

- **Led** a 3-person team to develop a real-time safety-first navigation tool using **C++, OpenStreetMap**, and custom graphics
- Implemented advanced routing with **A*, Dijkstra's**, and **Simulated Annealing**; leveraged **parallelism** to solve **TSP** with **90%** faster processing
- Achieved **<60ms** load time on **10K+** intersection maps and placed **top 30% (22/71)** for routing optimization

SILVERSCORE

- Designed and built a **full-stack** movie recommendation and rating platform with **React, AWS Lambda, DynamoDB, and Docker**, delivering real-time reviews, personalized watchliststo
- Launched a content-based **recommendation system** in **Python** and deployed it on **AWS Lambda** through **API Gateway,** allowing users to receive **tailored** movie suggestions
- Automated deployment and infrastructure with **AWS CDK,** leveraged **Docker** to **package dependencies** for Lambda, and set up **CloudWatch monitoring**, reducing deployment time by **50%** and cutting debugging overhead by **30%**

POP POP RUSH

- Developed a **real-time** reaction game in **C** on the **DE1-SoC** using **memory-mapped I/O, VGA graphics, and PS/2 mouse** input
- Utilized **hardware timers** and **interrupts** to implement randomized spawning, score tracking, and multiple game difficulties
- Maintained **input latency** under **50ms** across all test cases; ensured **100% stability** during gameplay and achieved **0 runtime crashe**s over 100+ game sessions

TECHNICAL SKILLS

Programming Languages: Python, C++, C, Java, JavaScript, HTML/CSS, Verilog

Tools & Frameworks: Docker, Git, AWS, React, PyTorch, TensorFlow, scikit-learn, NumPy, pandas, Matplotlib, Jupyter

Certifications: AWS Cloud Practitioner, MATLAB Onramp