ARUSHNA BALAGANESH

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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, Computer Systems, Software Design, Machine Learning, Databases

TECHNICAL SKILLS

Programming Languages: C, C++, Python, SQL, Java, JavaScript
Tools & Frameworks: Git, Linux, Docker, PostgreSQL, AWS (Lambda, DynamoDB, API Gateway, CDK), React, PyTorch, NumPy, scikit-learn
Certifications: AWS Cloud Practitioner, MATLAB Onramp

EXPERIENCE

KREMBIL RESEARCH INSTITUTE Toronto, ON
Machine Learning Research Assistant May 2025 – Present

- Developed end-to-end ML pipelines in Python for neurological signal classification, achieving **>90% accuracy**
- Trained and adapted **Vision Transformer (ViT) models in PyTorch** on synthetically generated chirp-spectrogram data, processing 5,000+ signal windows
- Built modular evaluation system with automated metrics (F1, ROC-AUC, confusion matrices), reducing manual analysis time by **~50%** and enforcing **reproducibility**
- Designed scalable spectral preprocessing workflows, **automating feature extraction** and normalization for stable training

NEUROTECH DESIGN TEAM Toronto, ON
Machine Learning Engineer September 2025 – Present

- Evaluated **neural architectures** (CNNs, LSTMs, transformers) on multimodal datasets from 25+ subjects
- Engineered **synchronized sensor-processing** pipelines, improving data quality and deployment stability
- Developed **deployment scripts** to run trained models in **Linux** environments, supporting reproducible inference
- Analyzed **quantization and pruning** tradeoffs, achieving **INT8 inference** with **1–2% accuracy loss** while improving runtime efficiency

PROJECTS

SILVERSCORE – Cloud-Native Backend Platform

- Built a **full-stack** movie recommendation and rating platform with **React, AWS Lambda, DynamoDB, and Docker**
- Developed **RESTful backend services,** supporting scalable cloud deployment and API integration
- Launched a content-based **recommendation system** in **Python** and deployed it on **AWS Lambda** through **API Gateway,** emphasizing scalable inference and request handling
- Automated **cloud infrastructure** using **AWS CDK**, containerized services with **Docker,** and implemented **CloudWatch monitoring**, reducing deployment time by **50%** and cutting debugging overhead by **30%**

SAFEROUTE – High-Performance Routing Engine (C++)

- **Led** a 3-person team to develop a real-time navigation system in **C++**, integrating OpenStreetMap and custom rendering
- Implemented routing algorithms (A*, Dijkstra's, Simulated Annealing) with parallelism, **accelerating computation by 90%**
- Achieved **<60 ms load time** on **10K+** intersection maps through algorithmic optimization of runtime bottlenecks
- Optimized memory usage through efficient data structures and STL containers, **reducing overhead by ~50%** on large-scale graph traversals

POP POP RUSH – Real-Time Embedded Systems Project (C)

- Built real-time **embedded** application in **C** on **DE1-SoC** using memory-mapped I/O and hardware peripherals
- Integrated **interrupt** and **timer-driven** control logic for deterministic event handling and performance
- Debugged low-level system behavior across hardware/software boundaries, **achieving <50 ms input latency**
- Validated stability with systematic testing, achieving **0 runtime crashes** across **100+** test runs