

Muhammad Hamza Khan

647-410-4413 | hamza51166@gmail.com | [GitHub](#) | [LinkedIn](#)

EDUCATION

Queen's University

Kingston, Ontario

BASc. Computer Engineering, Dean's Scholar

Sept. 2023 – Present (Graduating 2028 April)

- Relevant Coursework: Data Structures and Algorithms, Data Science, Software Development, Operating Systems, Computer Architecture, Embedded Systems, Digital Systems Engineering, Machine Learning, Computer Networks

EXPERIENCE

AMD (Advanced Micro Devices)

May 2026 – Present

Software Tools/Machine Learning Intern

Markham, Ontario

- Built a 4-stage Python/SKILL pipeline (PyAEDT, pyedb, Shapely) that auto-converts Ansys HFSS 3D Layout designs into native Cadence Allegro boards, cutting manual SI-to-CAD translation effort by 70%.
- Reduced per-design translation time from roughly 1 hour of manual CAD work to approximately 21 seconds by fully automating geometry extraction, unit and layer remapping, and copper-void decomposition.
- Engineered around a partially broken Allegro SKILL API surface (void, circle, and bulk-deletion functions) by pre-computing geometry entirely in Python and emitting only confirmed-working SKILL calls.
- Automated net-aware via classification and padstack generation (GND vs. signal, buried/microvia/backdrill) directly from extracted AEDT variables, producing a reusable, drop-in Allegro module per design.
- Built a multi-objective via optimization tool using NSGA-II and Bayesian optimization with a Gaussian Process surrogate to automatically tune via size, length, and placement against return-loss and TDR impedance targets.
- Cut manual via-configuration effort by 80% by replacing hand-tuned via generation with an automated, physics-informed search that pre-screens candidate designs before running full HFSS simulations.

Queen's University

Oct. 2025 – Apr. 2026

Undergraduate Researcher (Supervised by Prof. Ryan Eric Grant)

Kingston, Ontario

- Evaluated SmartNIC-based data exchange frameworks using MPI microbenchmarks on an NVIDIA SmartNIC, measuring end-to-end communication latency across architectures under varying message sizes and workloads.
- Demonstrated up to 4× lower communication latency compared to host-based approaches while maintaining sub-200 μs host overhead, highlighting performance trade-offs for SmartNIC-assisted data paths.
- Developed benchmarking and automation scripts in C++ and Linux/UNIX shell scripting, using SLURM for job scheduling across test runs and Git for version control of the test suite.

QMIND - Queen's AI Hub

Oct. 2025 – Apr. 2026

Machine Learning Engineer

Kingston, Ontario

- Fine-tuned OpenAI's CLIP model for deepfake detection using the GenVideo dataset (1M+ video samples), adapting vision-language embeddings and training procedures for reliable binary real vs. fake classification.
- Improved detection accuracy from 58% to 87%, validating robustness via cross-generator and degraded tests.
- Implemented training and data pipeline components in C++ and CUDA to accelerate model training, with Git used for version control throughout development.

University of Toronto

May. 2025 – Aug. 2025

Machine Learning Engineer (Supervised by Prof. Chi-Guhn Lee)

Toronto, Ontario

- Built a data-driven AI agent for Nestle that automated sales forecasting and insight generation, using LangChain, LangGraph, RAG, and SQL to retrieve internal data and generate explainable, data-backed predictions.
- Curated and labeled 1,000+ images using YOLOv8, developing automated filtering workflows that reduced manual review effort and improved dataset quality for downstream ML models.

PROJECTS

Deepfake Detector 🤖 | Python, AWS S3, OpenCV, PyTorch, Flask, Next JS, TailwindCSS

Jul. 2025

- Processed 3,200+ video clips by extracting and preprocessing frames from AWS S3 for supervised model training.
- Trained a ResNet18 + LSTM model for temporal deepfake detection, achieving 84% precision and 84% recall.
- Optimized inference through batching, enabling sub-500ms per-frame latency for near-real-time analysis.

ML Network Monitor 🤖 | Python, XGBoost, Scapy, Django, React JS

May. 2025 – Jun. 2025

- Processed 1,000+ packets per second of live network traffic, extracting features for real-time classification.
- Trained an XGBoost model to detect malicious traffic, achieving 92% precision and 87% recall in live evaluation.
- Deployed an inference pipeline to classify packets in real time, supporting low-latency monitoring and alerting.

TECHNICAL SKILLS

Languages + Core Systems: C, C++, Python, Java, Bash, Linux, Git, Docker, CUDA, SLURM, SQL

AI, ML & Cloud Infrastructure: PyTorch, TensorFlow, Scikit-Learn, ONNX, NumPy, Pandas, AWS, MS Azure