

## EDUCATION

**University of Toronto***Sep. 2022 – Jun. 2024**Master of Engineering, Electrical & Computer Engineering*

- **MEng Thesis (Individual): Pilot Training – Angle of Arrival and Channel Estimation in 5G Network** [Code]
- Compared Linear Minimum Mean Square Error (LMMSE) approach and Matrix-Pencil Method (MPM) for uplink channel estimation in multicell MIMO-OFDM systems with four distributed units (DUs) arranged in a square of radius 100 m, using a 3GPP-compliant MATLAB model.
- Showed that with pilot training in time or frequency domain, MPM yields higher angle-of-arrival accuracy than DFT-based and MMSE methods with limited antennas.
- Supervisor: Prof. Raviraj Adve

**University of Toronto***Sep. 2017 – Jun. 2022**Bachelor of Applied Science, Electrical Engineering*

- **Capstone Project (Teamwork): CNN NPU Overlay (MobileNetV1) on Intel Stratix 10 NX**
- Collaborated to replace the original matrix–vector unit of the Microsoft Brainwave NPU on Intel Stratix 10 NX with a custom convolution unit (scheduler + tiles + accumulator), achieving **4.3x** speedup and **76.6 GOP/s** on MobileNetV1 inference.
- Collaborate to develop a VLIW-based Python compiler and ISA simulator to translate Keras models into NPU instructions, managing memory allocation and cycle-accurate performance verification.
- Designed a pipelined accumulator enabling 330 MHz operation; implemented three-stage reduction-tree addition and opcode-based accumulation modes, verified correct synchronization and 450 MHz Fmax in Quartus.
- Supervisors: Prof. Vaughn Betz, Andrew Boutros

## PUBLICATIONS | PEER-REVIEWED CONFERENCES

1. Arash Ahmadian, Louis S.P. Liu, Yue Fei, Konstantinos N. Plataniotis, Mahdi S. Hosseini. *Pseudo-Inverted Bottleneck Convolution for DARTS Search Space*. IEEE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH AND SIGNAL PROCESSING (ICASSP), 2023.
2. Abnash Bassi, Yue Fei, Gilead Posluns, Mark C. Jeffrey. *Optimized Priority Scheduling for Faster Scalable Belief Propagation*. PROBABILISTIC GRAPHICAL MODELS (PGM), [In Submission], 2026.

## EXPERIENCE

**MediumAI** · Freelance*Jan. 2026 – Present**Software Development Engineer — Hybrid, Toronto, Canada*

- Build API integrations for a voice LLM-powered medical scribe agent, enabling secure multilingual clinical documentation.

**iQIYI.com** · Internship*Oct. 2025 – Dec. 2025**Data Analyst — Remote, Beijing, China*

- Combined three-arm A/B testing with causal forests and decision-tree rules for deployable personalization, lifting renewal rates from **37%** to **54.06%**.

**Qualcomm Canada** · Permanent Full-time*Jun. 2024 – Jul. 2025**RFIC Design Verification Engineer — Hybrid, Markham, Canada*

- Verified UWB receiver path(analog front end); improved UWB receiver bootup by reducing LNA charging delay **90%** ( $20\text{ ns} \rightarrow 2\text{ ns}$ ); Verified WLAN CP-PLL synthesizer across 500+ channels using UVM, ensuring coverage over 2G/5G bands.
- Developed GRU-based multi-head model for analog gain line-up optimization and an MLP for VCO capacitance prediction, replacing manual tuning across 1000+ frequency targets.

**University of Toronto – WIRLab** · Contract Part-time*Jul. 2021 – Sep. 2021**Research Assistant — Remote, Toronto, Canada*

- Explored RNN-based Transformer models and Attention mechanisms for NLP tasks.[Code]
- Applied PCA-based embedding visualization—as used in GloVe—to project high-dimensional embeddings into 2D/3D space using Python (NumPy, Matplotlib), enabling intuitive inspection of semantic clusters.

**Alphawave Semi** · Internship*May 2020 – Jun. 2021**SerDes Digital Verification Engineer — Remote, Toronto, Canada*

- Built UVM testbenches for SerDes subsystems (clocking, datapath, SRAM), expanding coverage to 50+ scenarios; Scaled Jenkins CI/CD regression from 4 to 60+ projects, enabling **15x** throughput growth.

## AWARDS AND CERTIFICATES

- Edward S. Rogers Sr. Department Betz Entrance Scholarship (\$5,000)
- Certificate in Engineering Business

2017

Jun. 2022

## INVITED TALKS

Qualcomm Panel Discussion: *Demystifying Machine Learning* — QWomen San Diego  
*Talk: From Channels to States — Machine Learning in the Language of Communication and Control*

Mar. 2025

## SELECTED ACADEMIC PROJECTS

### COMPUTER ARCHITECTURE & SYSTEMS

Parallel Beamforming & Cache-Coherence

Jan. 2024 – May. 2024

- Accelerated medical imaging by  $7\times$  ( $17\text{ s} \rightarrow 2.5\text{ s}$ ) via 16-thread data-parallel ultrasound beamforming with Intel SIMD intrinsics and memory optimizations (restrict); validated correctness (RMS error  $< 10^{-16}$ ) and scalability (1–16 threads). [\[Code\]](#)
- Designed and verified a 3-hop directory cache-coherence protocol (MSI/MESI) in Murφ, optimizing with an Exclusive (E) state to eliminate unnecessary bus transactions. [\[Code\]](#)

Computer Architecture Coursework (Team of 2)

Sep. 2021 – Dec. 2021

- Modeled data hazard detection in a modified MIPS 6-stage pipelined CPU, validating correctness via explicit stall-cycle annotation.
- Designed a perceptron-based branch predictor, combining local branch history with long global history to reduce MPKI under tight storage constraints.
- Implemented Tomasulo out-of-order execution with register renaming and dynamic scheduling, and an MSI directory-based cache-coherence protocol.
- Implemented a Bouquet L1 data prefetcher using IPCP, DPT, and a global history buffer (GHB) with confidence-based arbitration.
  - Evaluated feasibility using CACTI, showing  $\sim 24\%$  area overhead and parallel access within  $< 1\text{ ns}$  latency.

### ERROR-CORRECTING CODES & GRAPHICAL INFERENCE

Graph-Based Error-Correcting Codes

Sep. 2023 – Dec. 2023

- Implemented LDPC, fountain/LT, and Polar encoders/decoders over the binary-erasure channel, developing custom simulators in Julia and MATLAB. [\[Code\]](#)

Error Control Coding: Convolutional & BCH Codes

Jan. 2023 – May. 2023

- Implemented convolutional encoders with Viterbi decoding and binary BCH encoders/decoders over  $GF(2^m)$  using custom trellis structures in MATLAB.

### INFORMATION THEORY & SEMANTIC COMMUNICATIONS

Sampling-Based Semantic Source Coding (One-Shot Information Theory)

Jan. 2023 – May. 2023

- Implemented Poisson functional representation, rejection sampling, importance sampling, and hybrid Poisson + dithered quantization for 6G semantic source coding in MATLAB. [\[Code\]](#)

### WIRELESS COMMUNICATIONS & SIGNAL PROCESSING

LTE Signal Processing

Jan. 2022 – Apr. 2022

- Processed captured LTE signals for time/frequency synchronization, OFDM demodulation, and channel equalization; resampled 40 MHz RF data to the 30.72 MHz LTE rate and validated PSS/SSS detection.