

MURTADHA SAEED NISYIF

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WORK EXPERIENCE

ICT Teacher Mar 2026 – Jul 2026
International Community School Baghdad, Iraq

- Delivered the Cambridge ICT curriculum to Grades 1-8, teaching computer fundamentals, Microsoft Office applications, internet safety, digital citizenship, introductory programming, robotics, and computer hardware concepts
- Designed and implemented grade-specific lesson plans, assignments, and practical activities aligned with curriculum objectives and student learning outcomes
- Managed and maintained the computer laboratory by troubleshooting hardware/software issues, installing educational applications, and preparing classroom infrastructure
- Restored ICT instruction following a three-month teaching vacancy by developing structured learning plans to ensure academic continuity

Researcher - Machine Learning & Semantic Communications Jan 2024 – Dec 2025
University of Guelph Guelph, Ontario

- Investigated end-to-end latency bottlenecks across edge-cloud communication pipelines, identifying transitions between network transmission constraints and model execution bottlenecks
- Developed semantic communication frameworks using Swin Transformer architectures in PyTorch, achieving 30× bandwidth reduction and 29% lower latency while maintaining at least 96% task accuracy under variable network conditions
- Optimized inference pipelines through INT8 model quantization and edge-cloud hardware emulation, enabling realistic benchmarking under smartphone-class computational constraints
- Designed adaptive channel-selection algorithms using real-time bandwidth and latency telemetry to dynamically optimize transmitted semantic features under changing network conditions
- Established benchmarking frameworks comparing transformer-based transmission, quantized models, and conventional data transmission approaches
- Published first-author peer-reviewed IEEE conference papers focusing on semantic communication, task-driven feature extraction, and edge-cloud optimization

Teaching Assistant Sep 2024 – Dec 2025
University of Guelph Guelph, Ontario

- Led laboratory sessions and tutorials for over 100 undergraduate students in robotics and microcomputer interfacing, providing technical instruction and hands-on guidance
- Connected theoretical concepts with practical implementation through demonstrations, guided programming exercises, and hardware-based experiments
- Prepared and graded laboratory reports, programming assignments, and project demonstrations while providing technical feedback
- Mentored students during office hours, assisting with debugging, embedded systems development, and engineering design challenges

Software Developer Oct 2022 – Oct 2023
University of Guelph - Robotics Institute Guelph, Ontario

- Developed distributed robotic software architectures using ROS2, C++, and Python, implementing nodes, topics, and real-time sensor processing pipelines for autonomous robotic systems
- Architected and containerized a multi-technology software stack integrating ROS2, Node.js, Vue, and Docker to enable distributed real-time robotic control
- Designed and programmed ESP32-based smart mechatronic systems using Arduino firmware, implementing BLE authentication, Wi-Fi synchronization, and low-power operational states
- Automated cloud infrastructure deployment using Terraform, provisioning AWS EC2 instances, S3 storage, and application environments while reducing manual deployment overhead
- Implemented CI/CD workflows using GitLab and Jenkins, integrating automated testing and deployment processes for distributed applications

Information Technology Analyst Jul 2020 – Dec 2020
Kitchener Downtown Community Health Center - SRHC Kitchener, Ontario

- Configured centralized Samba-based file infrastructure, improving secure data access and distribution efficiency by 40% across multi-department teams
- Implemented FortiGate firewall policies and VPN infrastructure supporting secure remote access for 60+ users
- Deployed Docker-based monitoring infrastructure using Prometheus and Grafana to track service availability, SSH activity, and system anomalies

EDUCATION

University of Guelph | *Master of Applied Science - Semantic Communication* Dec 2025

University of Guelph | *Bachelor of Engineering - Computer Engineering* Apr 2023

SKILLS, TECHNOLOGIES, INTERESTS

Skills:	AI Systems; Machine Learning; Deep Learning; Semantic Communications; Edge Computing; Cloud Infrastructure; DevOps; Infrastructure as Code; Containerization; CI/CD; Distributed Systems; Embedded Systems; Network Monitoring; Agile/Scrum
Languages:	Python; C; Rust; JavaScript; Java; Go; Bash; HTML/CSS
AI & ML:	PyTorch; Swin Transformers; Stable-Baselines3; Reinforcement Learning; OpenAI Gymnasium; Scikit-learn; Model Quantization; Computer Vision; Signal Processing
Software Stack:	FastAPI; Flask; React; React Native; Node.js; Express.js; ROS2; Vue; PyTest; Swagger
Cloud & DevOps:	Docker; Kubernetes; Jenkins; GitLab CI/CD; Terraform; AWS (EC2, S3); Nginx; Cloudflare; Prometheus; Grafana; SSL/TLS; Linux Administration
Databases:	PostgreSQL; SQLite; MongoDB
Embedded Systems:	ESP32; Arduino; Microcontroller Programming; BLE; Sensor Integration; Robotics Hardware Interfaces

PROJECTS

Home Lab Administration | [Docker](#), [Terraform](#), [Jenkins](#), [Prometheus](#), [Grafana](#), [SSL/TLS](#)

- Orchestrated a self-hosted infrastructure environment managing 15+ Docker containers for media, web, and gaming services with automated SSL/TLS renewal, monitoring, and security hardening
- Implemented Prometheus and Grafana observability pipelines, Fail2Ban security policies, reverse proxy routing, and automated deployment workflows achieving 99.9% service availability

Real-Time Audio Filtering with Reinforcement Learning | [Python](#), [PyTorch](#), [Gymnasium](#), [Stable-Baselines3](#), [SciPy](#), [librosa](#)

- Constructed a custom OpenAI Gymnasium environment implementing FFT-based frequency-domain audio processing and adaptive harmonic filtering
- Trained PPO reinforcement learning agents using Stable-Baselines3 over 10,000 timesteps to optimize noise reduction performance against clean reference signals

Heart Disease Predictor | [Python](#), [Flask](#), [RESTful API](#), [HTML](#), [CSS](#), [JavaScript](#)

- Developed a full-stack machine learning application using Flask REST API and interactive frontend components, implementing preprocessing pipelines and hyperparameter optimization achieving 95% prediction accuracy

DevOps Server Infrastructure & CI/CD Pipeline | [Docker](#), [Jenkins](#), [Nginx](#), [Cloudflare](#), [PyTest](#), [Jest](#)

- Built containerized CI/CD infrastructure using Jenkins to automate testing and deployment workflows across multiple services using PyTest and Jest validation pipelines
- Configured secure application delivery using Nginx reverse proxy, Cloudflare integration, and automated Let's Encrypt SSL/TLS certificate management

PUBLICATIONS

Network-Aware Adaptive Semantic Image Transmission in Edge-Cloud Communications MECOM 2025

- Proposed an adaptive JSCC framework that couples Swin-Transformers with real-time network telemetry to optimize image transmission over dynamic 5G/6G core networks (Published, IEEE Xplore)

Boosting Edge-to-Cloud Data Transmission Efficiency with Semantic Transcoding CCECE 2024

- Utilized transformer-based edge-to-cloud models to achieve a 30× bandwidth reduction and 30% improvement in end-to-end latency for high-speed data systems (Published, IEEE Xplore)