

# MURTADHA NISYIF

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## WORK EXPERIENCE

<b>Teaching Assistant</b> <i>University of Guelph</i>	<b>Sep 2024 – Dec 2025</b> <i>Guelph, Ontario</i>
<ul style="list-style-type: none"><li>Led lab demonstrations and tutorials for 100+ students, providing hands-on guidance in implementing robotic control, navigation algorithms, and hardware/software integration</li><li>Facilitated technical comprehension by bridging theoretical lecture concepts with practical applications in microcomputer interfacing and robotic systems</li><li>Evaluated student performance across lab reports, project deliverables, and live demonstrations, providing constructive feedback to improve technical writing and problem-solving skills</li><li>Resolved complex student inquiries during office hours and Q&amp;A sessions, ensuring a deep understanding of both high-level robotics and low-level system interfacing</li></ul>	
<b>Researcher - Machine Learning</b> <i>University of Guelph</i>	<b>Jan 2024 – Dec 2025</b> <i>Guelph, Ontario</i>
<ul style="list-style-type: none"><li>Developed semantic communication pipelines using Swin Transformer models, achieving a 30× reduction in bandwidth usage and 29% lower latency while preserving atleast 96% task accuracy under variable network conditions</li><li>Extended models with adaptive deterministic mechanisms to handle bandwidth fluctuations and anomalies, ensuring stable real-time performance</li><li>Quantized encoder models to INT8 during edge-cloud simulations to emulate smartphone hardware constraints, enabling realistic performance benchmarking</li><li>Published a first-author paper in IEEE conference proceedings, detailing the novel integration of semantic communication with edge computing for real-time, near real-time and task-offloading applications</li></ul>	
<b>Software Developer</b> <i>University of Guelph - Robotics Institute</i>	<b>Oct 2022 – Oct 2023</b> <i>Guelph, Ontario</i>
<ul style="list-style-type: none"><li>Architected and containerized a multi-technology stack combining ROS2, Node.js, and Vue to enable seamless real-time control across distributed robotic systems</li><li>Implemented automated AWS infrastructure provisioning with Terraform and integrated CI/CD pipelines via GitLab and Jenkins, reducing manual deployment steps by 80%</li><li>Created a secure certificate management workflow that streamlined Let's Encrypt renewals and configured a Nginx reverse proxy to enforce HTTPS and granular CORS policies</li><li>Led the design and implementation of an accessible smart door system using ESP32, PIR sensors, and React Native, achieving over 95% reliability in extensive field tests</li></ul>	

## EDUCATION

University of Guelph   <i>Masters of Applied Science - Semantic Communication</i>	<b>Dec 2025</b>
University of Guelph   <i>Bachelors of Engineering - Computer Engineering</i>	<b>Apr 2023</b>

## SKILLS, TECHNOLOGIES, INTERESTS

<b>Skills:</b>	AI; DevOps; Cloud Computing; IaC; Containerization; CI/CD; Monitoring; Data Engineering; ML Ops
<b>Languages:</b>	Python; C++; C; Rust; JavaScript; HTML; Java; Bash; Go
<b>Tech Stacks:</b>	FastAPI; PyTorch; React; Flask; SQLite, PostgreSQL, MongoDB, Express JS; Node.js; Swagger; Docker; Git; Jenkins; Terraform; AWS; Kubernetes

## PROJECTS

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

- Orchestrate a comprehensive home lab environment managing 15+ Docker containers for media, web, and gaming services, configured auto-renewal SSL/TLS certification with Let's Encrypt, setup Prometheus/Grafana monitoring, and applied Fail2Ban for robust security achieving 99.9% uptime and detailed system analytics

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

- Developed a scalable Flask-RESTful API paired with an interactive HTML/JS frontend while leveraging the UCI dataset and implemented real-time feature scaling with hyperparameter tuning to deliver a 95% prediction accuracy, supporting timely clinical decision-making

Real-Time Noise Cancellation with RL | [Python](#), [PyTorch](#), [Gymnasium](#), [SciPy](#), [librosa](#)

- Created a bespoke OpenAI Gym environment incorporating FFT-based audio processing and trained a PPO agent to perform adaptive noise cancellation in real time, achieving processing speeds exceeding 5,200 FPS for high-fidelity audio performance

## PUBLICATIONS

<b>Network-Aware Adaptive Semantic Image Transmission in Edge-Cloud Communications</b>	<b>MECOM 2025</b>
<ul style="list-style-type: none"><li>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)</li></ul>	
<b>Boosting Edge-to-Cloud Data Transmission Efficiency with Semantic Transcoding</b>	<b>CCECE 2024</b>
<ul style="list-style-type: none"><li>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)</li></ul>	