

Murtadha Saeed Nisyif

Software Engineer

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Relevant Work Experience

Software Engineer - Research Assistant

Jan 2024 – Dec 2024

University of Guelph

Guelph, Ontario

- Conducted research on the application of transformer-based models for semantic data transmission in end-to-end (E2E) communications
- Developed and trained models using PyTorch to enhance the efficiency and reliability of data transmission
- Published findings in CCECE 2024, presenting results that showed an improvement in data transmission latencies

Software Developer

Oct 2022 – Oct 2023

University of Guelph - Robotics Institute

Guelph, Ontario

- Developed ROS2 modules in C++ and Python for an Assistive Robotic Feeding System for Elderly Individuals
- Managed and improved a React native mobile app, guaranteeing flawless BLE reliability with installed IoT devices to maximum accessibility
- Deployed an analytics application using AWS services (EC2 and S3) and managed PostgreSQL database for research survey data

Information Technology Analyst

Jul 2020 – Oct 2020

Kitchener Downtown Community Health Centre - SRHC

Kitchener, Ontario

- Worked with a tight budget for equipment upgrades, saving 45% of a \$10,000 budget
- Streamlined communication between doctors and patients, reducing patient waiting times by 30%
- Maintained existing OSCAR McMaster EMR system and migrated to the new TELUS healthcare infrastructure

Skills

Languages: C/C++/C#, Python, JavaScript, Java, HTML, MATLAB, CSS

Frameworks: PyTorch, Node.JS, React JS, Express JS, .NET, TensorFlow, ROS, Django

Databases: MongoDB, MySQL, SQLite, MSSQL

Other: Docker, AWS, Kubernetes, Git, Postman, Flask, Swagger, WoodPecker CI, HTTP, TCP, Xilinx, CMake

Projects

Transformer-based Semantic Data Transmission

- Explored the use of transformer-based models for semantic transcoding in E2E networks. Developed and trained models using PyTorch and demonstrated practical implementation on Xilinx SoC boards using Vitis AI interface

Homelab with Self-Hosted Services

- Managed and maintained a wide variety of applications deployed in Docker containers and Kubernetes, ensuring efficient resource utilization and isolation

Dynamic Noise Cancelling with RL

- Adapted an Automatic Noise Filtering algorithm for real-time application using Reinforcement Learning and Dynamic Sparse Training in PyTorch, providing significant improvements in voice clarity in varied noise environments

Text-to-Braille Real-Time Converter

- Powered by a Raspberry Pi, the device performs complex operations including extracting text from images captured by a camera module to ensure accessible and user-friendly braille reading experience for deaf-blind community members

ZAMAZ UTI Diagnosis - Image Processor

- Created a software system powered by a Raspberry Pi, to automate urine test readouts using image analysis and pixel calculations delivering a solution 16x faster than the gold standard

Education

University of Guelph | **M.A.Sc.**

Sep 2023 – Dec 2024

Masters of Applied Science in Computer Engineering

Guelph, Ontario

University of Guelph | **B.Eng.**

Sep 2019 – May 2023

Bachelor of Engineering: Major in Computer Engineering, Minor in Computer Science

Guelph, Ontario

Publications

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

Published @ IEEE CCECE (Aug 2024)

- Developed semantic communication techniques, reducing edge-to-cloud latency by up to 20%, and implemented transformer-based models to enhance data relevance and transmission efficiency