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Relevant Work Experience

Teaching Assistant - ENGG*3640: Microcomputer Interfacing

Sep 2024 – Dec 2024

University of Guelph

Guelph, Ontario

- Assisted in administering labs by guiding students through hardware/software integration tasks
- Evaluated and graded lab reports and assessments, ensuring clear feedback and fair evaluation
- Assessed student lab demonstrations and provided constructive feedback on their implementations
- Addressed student inquiries related to both lectures and lab work, reinforcing theoretical concepts through practical applications

ML Engineer - Researcher

Jan 2024 – Present

University of Guelph

Guelph, Ontario

- Performed latency data acquisition and thorough dataset diagnosis across diverse hardware setups, applying advanced analysis and feature engineering to identify key correlations-enabling the model to determine optimal transformer configurations for varying networks conditions
- Designed, implemented, and trained an adaptive model extension to the existing semantic communication transformer, improving real-time responses to network bandwidth fluctuations while maintaining at least 96% model accuracy
- Deployed Swin Transformer-based models in edge-cloud systems to offload processing from the core network, achieving higher throughput and reducing end-to-end communication latency by up to 29%, alongside a 30x reduction in network bandwidth utilization
- Deployed existing PyTorch-based implementations onto Kira SoCs using Vitis AI™, to leverage SoC's hardware acceleration

Software Developer

Oct 2022 – Oct 2023

University of Guelph - Robotics Institute

Guelph, Ontario

- Implemented a server-client backend system for an Assistive Robotic Feeding System in ROS2, utilizing Python and C++ packages to integrate robotic components with system software
- Designed and deployed a wheelchair-friendly smart door system with geo-fencing and automated operations, leveraging ESP32 microprocessors, PIR sensors, and smartphone control via a React Native app, showcasing systems integration
- Enhanced and maintained the smart door system's full-stack codebase, including a Node.js backend, React Native app, and Vue Dashboard, incorporating advanced features like voice recognition and passive BLE scanning and real-time user analytics for seamless user experience
- Deployed scalable, reliable full-stack app on AWS EC2 instances and S3 storage using Terraform for Infrastructure as Code (IaC), and Jenkins for CI/CD cloud infrastructure and automated deployment

Skills

Languages: C/C++, Python, Rust, Java, SQL, Bash, JavaScript, HTML, CSS, CMake
Frameworks: PyTorch, TensorFlow, Node.js, React, Express.js, ROS
Cloud and DevOps: AWS, Docker, Kubernetes, Terraform, Jenkins, PostgreSQL, MongoDB, SQLite
Tools and Protocols: Git, Postman, Flask, Swagger, Jira, CMake, HTTP, TCP, Ladder Logic (PLC)

Projects

Full-stack application Built and Dockerized a full-stack portfolio using React and Java (microservices architecture), hosting it on a home server via a Jenkins CI/CD pipeline and Minio S3 bucket

DevOps Homelab Setup dockerized applications, virtual machines, and Kubernetes clusters sing Terraform scripts. Managed personal Jenkins CI/CD pipelines, and implemented Ceph for distributed storage

RL Dynamic Noise Cancelling: Implemented real-time Automatic Noise Filtering using Reinforcement Learning and Dynamic Sparse Training in PyTorch

Education

University of Guelph | *MASc. - Computer Engineering*

University of Guelph | *B.Comp. - Computer Science*

University of Guelph | *B.Eng. - Computer Engineering*