Reza Rostam

Deep learning researcher and developer | control systems engineer

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SUMMARY OF QUALIFICATIONS

- Highly skilled **machine learning scientist/engineer**:
  - Over 7 years of experience in academic and industry settings
  - Led development of two successful products: Eagle & Falcon
- Expertly utilizes **RNNs**, **CNNs**, **GANs**, and **Transformers**
- Extensive **programming skills**:
  - C/C++, Python, Rust, MATLAB, SQL, JavaScript, and Mathematica
- Deep knowledge of **CUDA** programming and low-level optimization
- Proficient in **fine-tuning** and **quantization** techniques for **LLMs** to optimize performance and efficiency
- Expert in designing and implementing various **controllers**:
  - Adaptive, robust, nonlinear, and optimal
- Deep knowledge of **embedded systems** and **real-time OSes**
- Over a decade of international research experience, with publications in prestigious journals

EXPERIENCES

Senior Deep Learning Researcher

Picovoice Inc.

June 2022 – Ongoing Vancouver

- Led the design and development of a state-of-the-art speaker recognition and diarization engine from inception to completion
- Developed a high-performance CUDA inference engine for LLM models.
- Expanded language support for a Speech-to-Text engine.
- Pioneered new neural network architectures for NLP applications.
- Contributed to the creation of Orca, a cutting-edge Text-to-Speech engine, leveraging new GenAI architectures

Software Engineer and Embedded Lead

Picovoice Inc.

Oct 2020 – June 2022 Vancouver

- Ported several products to MCUs and Web utilizing WebAssembly
- Developed Shepherd - No-Code Voice AI on MCUs
- Designed a universal fast audio resampler in C
- Created and enhanced various SDKs (Python, Rust, Go, Node.js, etc.)

Instructor

McMaster Manufacturing Research Institute

June 2022 – Nov 2022 Vancouver

- Developed and taught 2 modules: Programming w Python & MATLAB

AREAS OF EXPERTISE

- Deep Learning & Time Series Analysis
- Physics-informed Machine learning
- Digital Signal Processing
- Optimization & Applied Mathematics
- Mechatronic/Control Systems

COMPUTER SKILLS

C-C++ : CUDA, Boost, GSL, Armadillo
gdb | make | git | CMake

Python : PyTorch, Numpy, Scipy, MxNet

MATLAB & Simulink | LabView

AWS | Azure | GCP

Embeded Systems : Assembly & C
ARM family (Cotex M/R/A) | FreeRTOS
Embedded Linux : Buildroot | Yocto

Linux | SQL | Ansible | Bash Scripting

ANSYS | COMSOL | SolidWorks

EDUCATION

Ph.D. in Control Systems

Thesis: A Hybrid Gaussian Process Approach to Robust Economic Model Predictive Control

M.Sc. in Mechanical Engineering

Thesis: Control of Adaptive Optics Systems Using Transverse Actuators

B.Sc. in Mechanical Engineering

Thesis: Vibration Suppression of Straight and Curved Beams Traversed by Moving Loads

Graduate Research Assistant

Control Engineering Laboratory

Sep 2016 – Ongoing Vancouver

- Managing research partnership with the industrial partner
- Mentoring four undergraduate and two Master of Science students in diverse research projects.
- Conducting journal reviews for several scientific journals

Research And Development Engineer

FanKavan Aral

Dec 2015 – Jul 2016 Tehran

- Designed and developed a portable robust data-logger

Project Leader

UBC Centre for Community Engaged Learning

Oct 2019 – Mar 2020 Vancouver

- Led a group of 20 students, after taking a series of workshops, to enhance the quality of education for kids in Vancouver, BC.

PROJECTS

Robust Economic Model Predictive Control with Application to Solar Thermal Systems

- Developed a novel control system by integrating model predictive control with Gaussian process, a machine learning technique
- Successfully addressed quasi-periodic unknown disturbances, such as energy demand in renewable energy systems

Recycling Plant Simulator

- Developed an open-source Python package for McMaster University to serve as a versatile recycling plant simulator, enabling the evaluation and testing of classification solutions for recycling challenges

Train Monitoring System

- Developed a portable data-logger to monitor ride comfort and wheelset temperature

GM Locomotive's DC Traction Motor Condition Monitoring and Fault Diagnostics

- Developed an intelligent monitoring system using vibration analysis with the discrete wavelet transform and Learning Vector Quantization

Magnetic Electron Lens for Transmission Electron Microscopy

- Built a magnetic electron lens in a 3-month project for implementation in Transmission Electron Microscopy

CERTIFICATIONS

- Certified System Administrator (LFCS)
- Essentials of Productive Teams (Mitacs)
- Foundations of Project Management (Mitacs)
- Design and Implementation of Smart Automation Systems (Shrif University)

COURSES TAUGHT

- Modeling of Mechatronic Systems
- Mechatronics System Instrumentation
- Automatic Control
- Modelling of Dynamic Systems
- Modern Control Engineering
- Mechanical Vibration
- MATLAB & Simulink for Engineers
- Programming with Python
- Programming with MATLAB

SELECTED COURSES

- Advanced Machine Learning
- Machine Learning and Data Mining
- Introduction to Artificial Intelligence
- Control Sensors and Actuators
- Modelling of Dynamic Systems
- Foundations in Control Engineering
- Multi-variable Feedback and Robust Control
- Self-Tuning and Adaptive Control
- Optimal Control

HONORS & AWARDS

Linux Foundation Training Scholarship
to become Certified System Administrator & Kubernetes Application Developer

Mitacs Research Training Award Proposal
in recognition of the research achievement

Faculty of Applied Science Award
in recognition of the research achievement

Best Presentation Award
BC universities "Systems&Control" meeting

Four Year Fellowships
in recognition of the academic achievement

Ranked 1st
amongst the B.Sc. alumni