# Reza Rostam

*Machine learning researcher and developer, control systems engineer*

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## SUMMARY OF QUALIFICATIONS

- Extensive **programming skills** in multiple languages (C, Python, MATLAB, Javascript, Modern C++)
- Highly skilled **machine learning scientist** with over 7 years of experience in academic and industry settings
- Proficient in working with **Recurrent** and **Convolutional** NNs
- Strong knowledge of **sensors, actuators, and instrumentation**
- Expert in designing and implementing various **controllers** (adaptive, robust, nonlinear, optimal)
- With over a decade of international research experience, including publications in prestigious journals

## EXPERIENCES

### Deep Learning Researcher

**Picovoice Inc.**

June 2022 – Ongoing  Vancouver

- Successfully designed and developed a Speaker Recognition and Diarization engine from start to finish.
- Expanded language support for the STT engine, adding compatibility for various languages, including Korean, Japanese, and more.

### Software Engineer

**Picovoice Inc.**

Oct 2020 – June 2022  Vancouver

- Optimized NLP engine with SIMD instructions (SSE, AVX, Neon)
- Ported platform to MCUs and web using wasm/js
- Designed universal audio downsampler in C
- Created/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

### 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 three scientific journals

## AREAS OF EXPERTISE

- Machine Learning & Time Series Analysis
- Mechatronic/Control Systems
- Embedded Systems
- Digital Signal Processing
- Optimization & Applied Mathematics
- Mechanical Vibrations (Nonlinear&Continuous)

## COMPUTER SKILLS

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

Python : MxNet, PyTorch, Numpy, Scipy
MATLAB & Simulink | LabView

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

AWS | Azure | GCP

Linux | 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

### Research And Development Engineer

**FanKavan Aral**

Dec 2015 – Jul 2016 Tehran

- Designed and developed data-loggers with custom PCBs and user-friendly software interfaces

### 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 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

### Active Noise Control in Pardis Coach using Different Fuzzy Controllers

- Designed a fuzzy controller to suppress the noise inside the coach

## 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