

# Amin Yahyaabadi

Vancouver, Canada

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## Work Experience

### [Sanctuary AI, Robotics Control Engineer,](#)

Vancouver, Canada, 2022 - Now

- Designed and developed Robodrake, the whole-body controller of Phoenix
- Led the automatic creation, development, and deployment of digital robot embodiments reducing the time to URDF by 18 times
- Designed a real-time dynamics and simulation engine for Phoenix based on Drake C++
- Optimized the Phoenix controller for low-latency performance running at 1 KHz with sub- $\mu$ s jitter
- Developed the RTI DDS communication layer for the Phoenix Hand Controller
- Implemented the operation logic and real-time deployment of the Phoenix Hand Controller
- Integrated Robodrake with the trajectories and tracking modes of Carbon (Phoenix AI)
- Designed the real-time continuous Inverse Kinematics Trajectory Planner used in Robodrake
- Created Granular to optimize deployment of the digital robot embodiments reducing the delivery time from 15min to 1s
- Built scalable processes around software building, packaging, Docker containerization, and CI/CD

### [Snowdrop Quantum, Software Engineer,](#)

Vancouver, Canada, 2024 - Now

- Developing Tangled with the Sanctuary AI's CEO to solve real-world problems using Quantum computers and demonstrate Quantum Supremacy

### [Post Media, Senior Software Engineer,](#)

New York, US, 2021 - 2022

- Developed the Post.news full-stack app via Solid-start and Solid-js
- Developed the Post.news Android app via Capacitor Ionic
- Optimized the performance of the app startup, news feed, payment pages, and user profiles

### [University of Manitoba, Creator of the Intelligent Drone Testbed for Control Systems and Verification,](#)

Winnipeg, Canada, 2018 - 2021

- Designed an intelligent drone testbed used for validation of new satellite or drone control algorithms and hardware, [M.Sc. Thesis](#)
- Identified the dynamics of the quadcopters intelligently with minimal measuring using Particle Swarm Optimization (PSO)
- Developed a custom onboard software for the drone to autonomously control the quadcopters's motion and operations

### [University of Manitoba/Canadian Space Agency, Leader of Flight Software/Onboard Computer for Iris,](#)

Winnipeg, Canada, 2018 - 2021

- Led the flight software and onboard computer teams for the Iris Satellite (ManitobaSat) launched by NASA/SpaceX
- Designed the modular onboard computer based on a Smart Fusion 2 system on a chip (FPGA/Arm Cortex)
- Developed custom real-time flight software running on FreeRTOS to control all the satellite's operations such as attitude and determination control

### [Magellan Aerospace, Auto Code Generation for Onboard Space Object Detection and Flight Software Applications,](#)

Winnipeg, Canada, 2018 - 2021

- Developed machine learning and analytical image processing algorithms for satellite's onboard detection of resident space objects (RSOs) from commercial-off-the-shelf star trackers.

### [Isfahan University of Technology, Intelligent vibration control with self-sensing piezoelectric actuator,](#)

Isfahan, 2016 - 2018

- Developed an intelligent control method for a distributed system using a self-sensing piezoelectric actuator and PSO
- Modeled the dynamics of the system with a novel FEA+FDA method to test the controller

## Education

University of Manitoba, M.Sc., Mechanical Engineering, Specialized in Aerospace, Controls, Robotics

Winnipeg, Canada, 2018 - 2021

GPA: 4.27/4.5

Isfahan University of Technology (IUT), B.Sc., Mechanical Engineering, Specialized in Controls and Mechatronics

Isfahan, Iran, 2013 - 2018

GPA: 18.03/20 (3.91/4)

Other Projects

- **Rhino XR-3 5 DOF Robot Arm Real-time Control via Arduino**  

Robotics

Control

C++

Matlab

Arduino

Selected Topics in Robot Technology, Supervisor: Dr. S. Balakrishnan
- **Barrett WAM 7 DOF Robot Arm Simulation and Analysis**  

Robotics

Control

Matlab

Robotics, Supervisor: Dr. H. Mousavi
- **Model Predictive Control of Robot Arm using Neural Networks**  

Machine Learning

Control

Robotics

Matlab

Neural Networks, Supervisor: Dr. M. Kamali
- **Intelligent Fuzzy PID Controller for a Bluetooth controlled DC Motor via AVR**  

AI

Fuzzy Logic

Control

Matlab

Intelligent Control, Supervisor, Mechatronic Systems, Dr. Sheikholeslam, Dr. Danesh
- **Parallel Image Processing using MPI and OpenCV**  

MPI

OpenCV

C++

Parallel Processing

Parallel Processing, Supervisor: Dr. I. Jeffrey
- **Custom Simulated Annealing Investigation for Salesperson Problem - New Mathematical Proof of The Multidimensional Newton's Weights Optimization Algorithm**  

Machine Learning

AI

SA

Neural Networks

Matlab

Applied Computational Intelligence, Supervisor: Dr. K. Ferens
- **Designing a Signal Processing and Measuring Instrument in Labview - Verifying The Instrument using Acoustic Analysis of a Trumpet in MSC ACTRAN**  

Signal Processing

Acoustics

Actran

LabView

Mechatronics Lab 2, Engineering Acoustics, Dr. Danesh, Dr. Loghmani
- **Multilayered Composite Shell Dynamics and Crack Analysis under Impact via Abaqus**  

FEM

Abaqus

Computation Mechanics

Computer-Aided Engineering, Supervisor: Dr. R. Jafari
- **Camber Angle Optimal Variation Design during Steering of Car via MSC ADAMS**  

Dynamics

Vibration

MSC ADAMS











Vehicle Dynamics, Supervisor: Dr. M. Esfahanian

Honours and Awards

- Fellowship for Education Purposes - \$40,500, UoM, Canada. 2018-2021
- Faculty of Graduate Studies Program Completion Scholarship - \$2,500, UoM, Canada. 2021
- International Graduate Student Entrance Scholarship (IGSES) - \$6,000, UoM, Canada. 2018
- Fellowship to Study at IUT for M.Sc Program without Entrance Exam, IUT, Iran. 2017
- Ranked top 10% among the students of the Mechanical Engineering Department, IUT, Iran. 2017
- Ranked top 0.3% among 260000 participants in Iranian University Entrance Exam for B.Sc. Studies. 2013
- Qualified as very good in Mathematics Alympiad Final International Round in the Netherlands. 2012
- Ranked 1st in Mathematics Alympiad National Round in Iran. 2011

Open-Source Experience





Made more than 28,000  contributions on [GitHub](#). Some of the notable projects are:

- The leader of the  [Atom-Community](#) organization that brings an integrated development environment to Atom
- The author of  [project\\_options](#) and  [setup-cpp](#) that provide a full C++ development environment used at Sanctuary AI, LLVM, Tesla Motors.
- The maintainer of  [zeromq.js](#) that provides the Nodejs interface to ZMQ used in Microsoft VsCode and Jupyter
- The author of the  [Zadeh](#), a library for fast fuzzy filtering and matching written in C++
- The author of  [minijson](#), a library for the fast minification of the JSON files written in D, C, and AVX2 and SSE4.1 SIMD.
- The author of  [AcuteML](#), an intelligent markup language for web development written in Julia
- The leader of the  [JuliaMatlab](#) organization, an open-source alternative for Matlab written in Julia
- The co-owner of the  [JuliaMusic](#) organization that provides music research tools (e.g.  [MusicXML.jl](#)) in Julia




Software and Programming Skills

- **Programming Languages:** C++, Rust, Python, Matlab, Julia, D, Go, TypeScript, AssemblyScript, Verilog
- **Technical Software:** Matlab/Simulink, RTI-Admin Console, Abaqus, LabView, Xilinx SDSoc - Vivado, Simpack, MSC Adams / Car, MSC Actran, Autodesk Inventor, CATIA, Proteus, Modelsim, Maple
- **Embedded Processors:** Xilinx Zynq 7020 SoC/FPGA, Smart Fusion 2 SoC/FPGA, Pixhawk Flight Controller (Px4), Arm Cortex A9, Arm Cortex M3, Parrot Mambo Flight Controller, Arduino Due /Uno, AVR Atmel STK500, Intel/AMD x86.64, Apple ARM64

Publications

- **A. Yahyaabadi**, M. Driedger,..., P. Ferguson, “ManitobaSat-1: A Novel Approach for Technology Advancement,” in *the Journal of IEEE Potentials*, 2020,  [pdf](#)
- **A. Yahyaabadi**, M. Driedger,..., P. Ferguson, “ManitobaSat-1: Making Space for Innovation,” in *IEEE Canadian Conference of Electrical and Computer Engineering (CCECE)*, Edmonton, Canada, 2019  [pdf](#)
- **A. Yahyaabadi**, P. Ferguson, “An intelligent multi-vehicle drone testbed for space systems and remote sensing verification,” in *Canadian Aeronautics and Space Institute (CASI) ASTRO*, Montreal, Canada, 2019  [pdf](#)
- **A. Yahyaabadi**, P. Harrison, P. Ferguson, “Auto Code Generation for Onboard Space Object Detection and Other Flight Software Applications - A Feasibility Study,” in *Canadian Aeronautics and Space Institute (CASI) ASTRO*, Montreal, Canada, 2019  [pdf](#)

*Attended Conferences*

- **Canadian Aeronautics and Space Institute (CASI) ASTRO** Montreal, Canada, 2019  
Submitted two papers and presented them:
  - “An intelligent multi-vehicle drone testbed for space systems and remote sensing verification”  [pdf](#)
  - “Auto Code Generation for Onboard Space Object Detection and Flight Software Applications”  [pdf](#)
- **ArcticNet (ASM) 2018** Ottawa, Canada, 2018  
Presented my work by the poster and oral presentation:
  - “A multi-vehicle drone testbed for space systems and remote sensing verification”  [Proceedings P. 198](#)

*Additional Experience*

- **Summer Internship in Bama Co** Summer 2014/2016
  - Condition monitoring and predictive maintenance planning of machinery and vehicles in [Bama Co](#)
- **Jury Member at Isfahan Mathhouse** 2013 - 2018
  - Member of the Jury in [Isfahan Mathhouse](#) for choosing qualified participants for International Competitions (e.g., Olympiad)
  - Olympiad competition participants test grader in Isfahan Mathhouse
- **Teaching Assistant at the Isfahan University of Technology** Fall 2016
  - Statics, instructor: Dr. S. Akbarzadeh

















*GRE*

- Quantitative: 170/170
- Verbal: 151/170
- Analytical Writing: 3.5

*Selected Courses*

- Applied Computational Intelligence: 4.5/4.5
- Selected Topics in Robot Technology: 4.5/4.5
- Mechatronics: 20/20
- Robotics: 19.5/20
- Neural Networks: 20/20
- Intelligent Control: 18/20
- Applied Vibrations: 19.6/20
- Acoustics: 19.5/20
- Machinery Dynamics: 19.3/20
- Vehicle Dynamics: 18.3/20
- Mechatronics Lab 1 and 2 : 18.25/20 and 19/20
- Applied Electrical/Electronics: 19.03/20
- Dynamics: 18.5/20
- Computer-aided design: 18.1/20
- Engineering Mathematics: 20/20
- Differential Equations: 20/20
- General Mathematics: 20/20
- Advanced Dynamics (Audited)
- Parallel Processing (Audited)

*References*

- **Dr. Nils Smit-Anseeuw**, Principal Controls Engineer Sanctuary AI, Canada  
 [nils.smit-anseeuw@sanctuary.ai](mailto:nils.smit-anseeuw@sanctuary.ai)  [Page](#) University of Michigan Alumni, US
- **Dr. H. Khadivi**, Control Engineering Team Lead Sanctuary AI, Canada  
 [hatef@sanctuary.ai](mailto:hatef@sanctuary.ai)  [Page](#) The University of British Columbia Alumni, Canada
- **Dr. P. Ferguson**, Associate Professor of Mechanical Eng, NSERC Research Chair, University of Manitoba, Canada  
 [philip.ferguson@umanitoba.ca](mailto:philip.ferguson@umanitoba.ca)  [Page](#)  [Page](#) Massachusetts Institute of Technology (MIT) Alumni, US
- **Dr. S. Balakrishnan**, Professor of Mechanical Eng. University of Manitoba, Canada  
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- **Dr. K. Ferens**, Assistant Professor of Electrical and Computer Eng. University of Manitoba, Canada  
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