Amin Yahyaabadi

CodeLLM - Software Engineer at Abacus AI
Vancouver, Canada

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Experience

Abacus AI, CodeLLM - Software Engineer

Vancouver, Canada / San Francisco, USA, Nov 2024 - Present

- Leading the development of CodeLLM, a new AI Code Editor featuring ChatLLM

Sanctuary AI, Robotics Control Engineer

Vancouver, Canada, 2022 - Nov 2024 · 2 yrs 11 mos

- 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-µs 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 15m to 1s
- Built scalable processes around software building, packaging, Docker containerization, and CI/CD

Snowdrop Quantum, Software Engineer,

Vancouver, Canada, May 2024 - Present · 8 mos

- Developing Tangled to solve real-world problems using Quantum computers and demonstrate Quantum Supremacy

Post Media, Senior Software Engineer

Vancouver, Canada / New York, USA, 2021 - 2022 · 10 mos

- 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, *M.Sc. Thesis,*

Winnipeg, Canada, 2018 - 2021 · 3 yrs 1 mo

- Designed an intelligent drone testbed used for validation of new satellite or drone control algorithms and hardware
- 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 and Onboard Computer for the Iris Satellite (ManitobaSat)

Winnipeg, Canada, 2018 - 2021 · 3 yrs 1 mo

- 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, Sep 2018 - Sep 2019 · 1 yr 1 mo

- 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, *B.Sc. Thesis*

Isfahan, 2016 - 2018 · 2 yrs 1 mo

- 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, Canada
M.Sc., Mechanical Engineering, Aerospace, and Controls, Sep 2018 - Sep 2021
GPA: 4.27/4.5

Isfahan University of Technology (IUT)
B.Sc., Mechanical Engineering, Mechatronics, and Controls, Sep 2013 - Feb 2018
GPA: 18.03/20 (3.91/4)

Other Projects

Rhino XR-3 5 DOF Robot Arm Real-time Control via Arduino
Selected Topics in Robot Technology, Supervisor: Dr. S. Balakrishnan

Barrett WAM 7 DOF Robot Arm Simulation and Analysis
Robotics, Supervisor: Dr. H. Mousavi

Model Predictive Control of Robot Arm using Neural Networks
Neural Networks, Supervisor: Dr. M. Kamali

Intelligent Fuzzy PID Controller for a Bluetooth-controlled DC Motor via AVR
Intelligent Control, Supervisor: Dr. F. Sheikholeslam
Mechatronic Systems, Supervisor: M. Danesh

Parallel Image Processing using MPI and OpenCV
Parallel Processing, Supervisor: Dr. I. Jeffrey

Custom Simulated Annealing Investigation for Salesperson Problem - New Mathematical Proof of The Multidimensional Newton's Weights Optimization Algorithm
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
Mechatronics Lab 2, Supervisors: Dr. M. Danesh
Engineering Acoustics, Supervisor: Dr. A. Loghmani

Multilayered Composite Shell Dynamics and Crack Analysis under Impact via Abaqus
Computer-Aided Engineering, Supervisor: Dr. R. Jafari

Honours and Awards

Fellowship for Education Purposes - $40,500, U of M, Canada, 2018-2021
Faculty of Graduate Studies Program Completion Scholarship - $2,500, U of M, Canada, 2021
International Graduate Student Entrance Scholarship (IGSES) - $6,000, U of M, Canada, 2018
Fellowship to Study at IUT for M.Sc Program without Entrance Exam, 2017
Ranked top 10% among the students of the Mechanical Engineering Department, IUT, 2017
Ranked top 0.3% among 260000 participants in the 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 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,*

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

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

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

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
- Auto Code Generation for Onboard Space Object Detection and Flight Software Applications

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 Membership at Isfahan Mathhouse, 2013 - 2018

- Member of the Jury in Isfahan Mathhouse for choosing qualified participants for International Competitions (e.g., Alympiad)
- Alympiad 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

Arvind Sundararajan
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Dr. Nils Smit-Anseeuw
Principal Controls Engineer at Sanctuary AI, Canada
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Dr. H. Khadivi
Control Engineering Team Lead at Sanctuary AI, Canada
The University of British Columbia Alumni, Canada
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Dr. P. Ferguson
Associate Professor of Mechanical Eng, NSERC Research Chair, University of Manitoba, Canada
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Dr. S. Ziaie-Rad
Professor of Mechanical Eng, Isfahan University of Technology, Iran
Imperial College London Alumni, UK
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