

6 yrs
INDUSTRY
DELIVERY

Ph.D.
MECHATRONIC
SYSTEMS

Azure + AWS
4 × AWS CERTIFIED
PRODUCTION ON AZURE

533+
CITATIONS
H-INDEX 10

15
PEER-REVIEWED
PUBLICATIONS

50+
COURSE SECTIONS
TAUGHT

EXPERIENCE

CORE STRENGTHS

- AI Lead (promoted from ML Developer)2025 – Present
- CoGo → Lumicent · Industrial Asset Risk Management platform · Vancouver, BC
- Architected and shipped the production agentic copilot — an LLM agent acting on live asset, sensor, anomaly, alarm, maintenance and risk data through governed structured tools. Tool-grounding against the real product, rather than a chatbot bolted onto it, is the entire differentiator.
 - Built the orchestration beneath it on Azure OpenAI: stateful sessions, chained responses, bounded tool loops, context compaction and audit persistence — hardened for the real failure modes with retries, circuit breakers and concurrency gating, on Entra ID and Managed Identity rather than embedded keys.
 - Added multi-pass reasoning: vector retrieval over prior assessments surfaces precedent that a second model pass folds into the current analysis — continuity a single-shot response cannot produce.
 - Shipped automated reporting turning raw vibration, temperature, anomaly and alarm telemetry into a plain-language daily briefing per asset — what changed, what is at risk, what needs attention — in place of a dashboard someone must interpret.
 - Own AI planning end to end: initiative decomposition into Azure DevOps work items, sprint planning, primary reviewer for the team's AI code and architecture; present capability directly to Sales and Marketing as customer-facing value.

- Technical Lead — Product, Cloud & Device SystemsJan 2024 – Sep 2025
- Cannabix Technologies Inc. · Publicly traded · breath-based detection devices · Burnaby, BC
- Owned the architecture of a real-time AWS platform — IoT Core, EventBridge, DynamoDB — powering 24/7 alcohol monitoring for customers globally: automated test scheduling, device registration, compliance reporting.
 - Set the roadmap the rest of engineering built against, reporting to the VP: led cross-functional design across firmware, mechanical and electronics, weighing feasibility against resource constraints, compliance and market readiness.
 - Proactive recalibration notification on SNS/email — missed recalibrations down 60%; a distributor compliance dashboard MVP in under two weeks against a hard deadline; versioned OTA release delivery for a globally deployed fleet on S3.
 - Took ownership of regulatory risk: non-editable audit trails for legal test data, signed off directly with distributor legal teams. Mentored junior developers and led the GUI codebase transition.

- Senior Machine Learning EngineerAug 2021 – Jan 2024
- Cannabix Technologies Inc. · Burnaby, BC
- Built the ML pipelines behind alcohol, THC and metabolic breathalyzers — cleaning, feature engineering, classification and regression on sensor data — lifting accuracy by modelling out humidity, pressure and cross-contamination interference.
 - Designed the serverless AWS backend (Cognito, Lambda, S3, RDS, SNS, SES) for devices, users and real-time test scheduling, the PyQt device GUI on top of it, and a distributor portal serving North America, Australia and South Africa.
 - Automated recalibration with dry-gas reference tests and ML self-correction — ~50% longer device lifespan; on-device diagnostics and OTA updates cut support load by 40%+.

- Senior ML Scientist / Software EngineerMar 2020 – Jan 2023
- Ballard Power Systems · World-leading hydrogen fuel cell manufacturer · incl. research internship
- Automated optimization-based EIS analysis of large electrochemical datasets for air- and water-cooled stacks — built so maintenance and sales staff with no coding background could run it, and used directly by experimentalists.
 - Detected hydrogen starvation in PEMFC stacks in real time with autoencoders, one-class SVM and clustering, over a C++/Python model of air-stoichiometry effects on hydrogen emissions.
 - Presented Ballard as lead scientist at the International Workshop on Impedance Spectroscopy, Chemnitz, Germany (2022).

- Research Associate — Mechatronic Systems EngineeringSep 2016 – Apr 2021
- Simon Fraser University · Greater Vancouver
- Built a virtual hydrogen sensor for fuel-cell starvation detection in Python, MATLAB and Visual C++, and a pseudo-2D SOFC model predicting hydrogen concentration, current density and cell temperature up to 10⁵× faster than existing methods.
 - +14% PEMFC peak power density from a two-phase model coupled to a genetic algorithm; SOFC electrode properties recovered by pattern-search inverse optimization; CFD and phase-change optimization of a 72 kW solar-assisted absorption chiller; a definitive review of fuel-cell CFD/FEM modelling in ANSYS and COMSOL.

- Graduate Research AssistantSep 2012 – Jul 2015
- University of Tehran · Tehran, Iran
- Hybrid dry-cooling-tower and solar-chimney design with the Shahid Rajaei 1000 MW thermal power plant, raising plant thermal efficiency by 0.5%; led a 15-person team on a residential net-zero energy building. Co-translated *An Introduction to Heat Transfer* (Bergman, Lavine, Incropera & DeWitt) into Persian.

RECOGNITION

SFU Big Data Scholarship — real-time analysis of commercial hydrogen fuel cell data

Ranked 1st of ~120 undergraduates — University of Tehran, Iran's top-ranked mechanical engineering department

Straight A+ throughout — B.Sc. 4.00 · M.Sc. 4.00 · Ph.D. 4.33

~50 university course sections taught, 2017–2021

Best Presentation — 2nd BC Universities Systems & Control Meeting, UVic (2019)

TECHNICAL

AI & Machine Learning

Agent orchestration & tool-calling · RAG · vector search & embeddings · Azure OpenAI · deep learning · CNNs & autoencoders · SVMs & classical estimators · genetic algorithms · anomaly & fault detection · time-series ML · feature engineering · model evaluation · PyTorch · TensorFlow · scikit-learn · ONNX

Signal & Data

FFT & spectral analysis · wavelet transforms · filtering & denoising · vibration analytics · environmental drift correction · large-scale data cleaning · SQL & query optimization · NumPy · pandas · SciPy

Cloud, Platform & Edge

Azure App Service · Azure DevOps & CI/CD · Azure OpenAI · Azure AI Search · Entra ID / Managed Identity · AWS Lambda, SageMaker, IoT Core, DynamoDB, EventBridge, S3, API Gateway · serverless architecture · Docker · Raspberry Pi & embedded Linux · production LLM resilience

Software Engineering

Python · C++ · TypeScript · React & Next.js · FastAPI · PyQt · REST API design · system design · Git & code review · testing & CI

Domain

Solid oxide & PEM fuel cells · sensor physics · CFD · modal analysis · inverse problems · thermodynamics · heat & mass transfer · energy conversion

CERTIFICATIONS

AWS

Certified Machine Learning Engineer — Associate

AWS

Certified Solutions Architect — Associate

AWS

Certified AI Practitioner — Foundational

AWS

Certified Cloud Practitioner — Foundational

- Technical leadership of AI architecture, roadmap and code review — without leaving the codebase
- End-to-end ownership: model, data pipeline, cloud platform, deployment and customer-facing interface
- Production LLM agents with governed access to live operational data and tools
- Signal processing and time-series ML on industrial sensor data
- Cloud architecture on Azure and AWS, extending down to edge devices
- Commercial translation — turning technical capability into value for sales, marketing and executive audiences

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Domain

Solid oxide & PEM fuel cells · sensor physics · CFD · modal analysis · inverse problems · thermodynamics · heat & mass transfer · energy conversion

EDUCATION

Ph.D., Mechatronic Systems Engineering 2021

Simon Fraser University · Vancouver

GPA 4.33 / 4.33

Modelling & Diagnosis of Solid Oxide Fuel Cells · Prof. Krishna Vijayaraghavan · SFU Big Data scholarship

M.Sc., Mechanical Engineering 2015

University of Tehran · GPA 4.00 / 4.00

Thermal sciences & energy conversion

B.Sc., Mechanical Engineering 2012

University of Tehran · GPA 4.00 / 4.00

Ranked 1st of ~120 — Iran's top-ranked mechanical engineering department

CERTIFICATIONS

AWS

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AWS

Certified Solutions Architect — Associate

AWS

Certified AI Practitioner — Foundational

AWS

Certified Cloud Practitioner — Foundational