

# HADI AGHAZADEH

Senior Data Scientist | Applied Scientist | Machine Learning Engineer

[hadi.aghazadeh@ucalgary.ca](mailto:hadi.aghazadeh@ucalgary.ca) | +1 (403) 400-7294 | Calgary, Alberta, Canada

[linkedin.com/in/hadi-aghazadeh](https://linkedin.com/in/hadi-aghazadeh) | [github.com/hadiagha](https://github.com/hadiagha)

Author: *Applied Reinforcement Learning: Business Optimization and LLM Fine-Tuning* (Manning Publications)

*Work Authorization: Open Work Permit; Permanent Residence Application in Progress*

## Professional Summary

Senior Data Scientist and Applied Machine Learning Researcher with **8+ years of experience** building production forecasting, optimization, and decision-intelligence systems. Own the end-to-end development and operation of **Locational Marginal Price forecasting models for 10,000+ pricing nodes across the United States and Canada**, covering feature engineering, applied research, model development, distributed training, deployment, APIs, monitoring, and production maintenance. Specialized in **time-series forecasting, Operations Research, mixed-integer optimization, and Reinforcement Learning**, with hands-on experience building cloud-native ML systems using Kubernetes, Google Cloud, Snowflake, Kafka, Terraform, and Pulumi. Ph.D. Candidate, published researcher, and author of a practical book on applied Reinforcement Learning.

## Technical Expertise

**Forecasting and Machine Learning:** Time-Series Forecasting, Demand Forecasting, LMP Forecasting, Feature Engineering, Backtesting, Model Evaluation, Deep Learning, Transformer Architectures, Large Language Models, RAG, Agentic AI, Foundation Model Fine-Tuning

**Optimization and Decision Science:** Operations Research, Mixed-Integer Linear Programming, Security-Constrained Unit Commitment, Power-Flow Optimization, Branch-and-Bound, Cutting Planes, Reinforcement Learning, Deep RL, Contextual Bandits, Dynamic Pricing, Vehicle Routing, Supply Chain Optimization

**Production ML and Infrastructure:** Kubernetes, Google Cloud Platform, Snowflake, Kafka, Terraform, Pulumi, Grafana, Sentry, Databricks, MLflow, Docker, AWS, SageMaker, Bedrock, Microsoft Azure, CI/CD for ML, Model Serving, API Development, Production Monitoring

**Frameworks and Tools:** Python, PyTorch, TensorFlow, LangChain, LangGraph, Hugging Face, Model Context Protocol, OpenAI API, Claude API, Apache Spark

## Professional Experience

### Senior Data Scientist

March 2026 – Present

*Enverus*

*Calgary, Canada*

- Own the end-to-end development and production operation of **Locational Marginal Price forecasting systems covering more than 10,000 pricing nodes across U.S. and Canadian electricity markets**.
- Lead the complete machine-learning lifecycle, including data analysis, feature engineering, applied forecasting research, model development, backtesting, distributed training, deployment, API development, monitoring, incident resolution, and ongoing maintenance.
- Build and operate large-scale training and inference pipelines using **Kubernetes** as the primary orchestration platform, with **Google Cloud** for model serving and storage, **Snowflake** for analytical data workloads, and **Kafka** for streaming data.
- Develop reproducible deployment and model-management workflows using **Pulumi and Terraform**; implement production observability and error monitoring using **Grafana and Sentry**.
- Research and prototype large-scale **Mixed-Integer Linear Programming models for power-flow and Security-Constrained Unit Commitment optimization**, with an emphasis on fast and computationally efficient electricity-price optimization.
- Investigate **Reinforcement Learning-guided cutting-plane selection** to improve branch-and-bound search and accelerate the solution of large-scale power-system optimization models.

### Machine Learning Engineer and Technical Lead

April 2024 – February 2026

*Bits in Glass Inc.*

*Calgary, Canada (Remote)*

- Led the technical development of a production **hierarchical RAG platform processing more than 20 million oil-and-gas documents**, combining structured and unstructured data, hybrid retrieval, embedding-model evaluation, Databricks, LangChain, and Model Context Protocol.
- Architected a production **dynamic fuel-pricing optimization system** using Integer Linear Programming and

contextual bandits, supporting adaptive margin- and volume-based pricing strategies while reducing pricing decision time from several hours to **under 30 minutes**.

- Directed the implementation of an **Agentic AI framework for railway legacy-system modernization**, automating the extraction of business rules and user stories from COBOL applications.
- Built an AI-enabled **energy-sector digital twin** integrating AWS TwinMaker, IoT sensor data, 3D asset models, and natural-language interaction for real-time scenario exploration.
- Developed an end-to-end LLM document-processing pipeline using LangGraph and Databricks Mosaic AI, achieving **95%+ structured extraction accuracy** on batch invoice data.
- Designed a repeatable evaluation framework for enterprise RAG systems with limited ground-truth data, enabling systematic measurement of retrieval quality, answer quality, and failure modes.

## Machine Learning Developer

May 2023 – September 2023

*AltaML*

*Calgary, Canada (Hybrid)*

- Developed a scalable hybrid demand-forecasting system for **100+ fuel-retail locations**, improving inventory planning and generating more than **\$1 million in projected annual savings**.

## Senior Data Scientist

May 2021 – June 2022

*Snapp, Largest Ride-Hailing Platform in the Middle East*

*Tehran, Iran (Hybrid)*

- Led the development of a Reinforcement Learning-based dynamic surge-pricing system that improved order-fulfillment rate by **5%** across more than **200,000 daily orders**, improving marketplace balance, revenue performance, and driver utilization.
- Directed development of an unsupervised fraud-detection system achieving **90%+ recall** and eliminating more than **300 hours of manual review per month**.

## Data Scientist

January 2018 – April 2021

*Fanap (PARSA)*

*Tehran, Iran*

- Led development of an end-to-end ATM cash-demand forecasting and replenishment optimization system, achieving **17% MAPE** and reducing operational costs by **10%**.

## Education

### Ph.D. Candidate, Geomatics Engineering, GPA: 4.0/4.0

July 2022 – Oct 9, 2026 Defense

*University of Calgary*

*Calgary, Canada*

*Research focus: Reinforcement Learning, real-time policy optimization, vehicle routing, disaster-response logistics, and transportation optimization.*

### M.Sc., Industrial Engineering

2015 – 2018

*Amirkabir University of Technology (Tehran Polytechnic)*

*Tehran, Iran*

### B.Sc., Industrial Engineering

2011 – 2015

*Iran University of Science and Technology*

*Tehran, Iran*

## Selected Publications and Book

- **Aghazadeh, H.** (2026). *Applied Reinforcement Learning: Business Optimization and LLM Fine-Tuning*. Manning Publications. [[Publisher Link](#)]
- Aghazadeh, H., and Wang, X. (2026). *HELP-RL: Real-Time Policy Optimization with Hierarchical Decoder for Heterogeneous and Stochastic Disaster Response Logistics*. Computers & Operations Research.
- Aghazadeh, H., Wang, Y., Sun, S., and Wang, X. (2023). *Dray-Q: Demand-Dependent Trailer Repositioning Using Deep Reinforcement Learning*. Transportation Research Part C: Emerging Technologies.
- Aghazadeh, H., Wang, X. (2026). *Multi-Task Vehicle Routing with Hierarchical Option Learning*. 34th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems.
- Aghazadeh, H., Safarzadeh, R., and Wang, X. (2025). *GAGE-Q: Reinforced Genetic Algorithm Using Spatial Neighborhood Graph Embedding for Green Intermodal Transportation*. Advances in Cartography and GIScience of the ICA.
- Aghazadeh, H., and Wang, X. (2025). *Hierarchical Reinforcement Learning for Real-Time Policy Optimization in Complex Logistics Networks*. ACM KDD 2025 (Supply Chain workshop), Toronto, Canada.
- Aghazadeh, H., and Wang, X. (2023). *Reinforcement Learning for Intermodal Transportation Planning with Time Windows and Limited Cargo Capacity*. ACM SIGSPATIAL International Workshop on Computational Transportation.

## Certifications

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- **Databricks Certified Machine Learning Associate** (2024) [\[Credential\]](#)
- **Reinforcement Learning Specialization**, University of Alberta / Coursera (2022) [\[Credential\]](#)

## Selected Honors and Awards

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- **Alberta Innovates Graduate Student Scholarship** (2024): \$31,000 per year for two years.
- **First Place, Amii Reinforcement Learning Competition** at the Upper Bound Conference (2024).
- **Open Doctoral Scholarship**, University of Calgary (2024): \$15,000.
- **First Place, AI Demand Forecasting Competition** at Amirkabir University of Technology (2018), placing first among more than 150 teams.

## Leadership and Teaching

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- **Vice President and Student Representative**, Graduate Geomatics Group, University of Calgary (2023–2024); led a graduate engineering community of more than 50 members.
- **Teaching Assistant**, University of Calgary: Engineering Design, Programming with Data, and Spatial Data Mining.
- **Course Instructor and Creator**: Contextual Multi-Armed Bandits in Python and Reinforcement Learning for Operations Research.
- **Peer Reviewer** for machine learning, transportation, optimization, and spatial-computing journals.