Lakshay Arora

Website Portfolio Github LinkedIn

Ph.D. candidate with 5+ years of experience applying AI/ML to solve real-world business problems. Strong record of delivering results across finance, aerospace, and healthcare using data-driven modeling, deep learning, and generative AI.

EDUCATION

Doctor of Philosophy, Aerospace Engineering , Carleton University, Canada Master of Science (Thesis-based), Aerospace Engineering, Wichita State University, USA Bachelor of Technology, Aeronautical Engineering, Manipal Institute of Technology, India	2025 2020 2017
Skills	
 Programming: Python, SQL, Julia, MATLAB, R, C++ Machine Learning: Deep Learning, Transformers, RL, Generative AI Big Data & Cloud: Azure, GCP, PySpark, Hadoop Frameworks: TensorFlow, PyTorch, Scikit-learn, LangChain Other: Tableau, Git, Streamlit, Flask, LaTeX, Jupyter 	
TECHNICAL EXPERIENCE	
 Assistant (Part-time with Independent Consultant), Deloitte Inc. Investigating suspicious financial transactions for CIBC's AML compliance unit. Built Python-based rule filters to improve transaction alert review process. Accelerated false-positive triage by 28%. Tools: Microsoft Excel, AML backend system. 	Toronto, Canada March 2025 – Present
 Applied Machine Learning Researcher, Spacecraft Robotics and Control Lab Led spacecraft path optimization under uncertainty using Koopman Expectation. Developed trajectory models integrated with deep learning. Boosted guidance accuracy by 84% and reduced simulation time by 50%. Tools: Julia, Python, TensorFlow, MATLAB, Simulink. 	Ottawa, Canada Sept 2020 – June 2025
 AI/ML Research Associate, AI Quest Inc. & George Brown College (Mitacs BSI) Analyzed 30GB+ pharma datasets and trained XGBoost models. Delivered dashboards to stakeholders; improved ADR prediction by 15%. Tools: Python, Pandas, Deep learning, XGBoost. 	Toronto, Canada May 2022 – Sept 2022

PROJECTS

Student Cost-of-Living Calculator (GenAI + Streamlit)

- Built a Streamlit-powered cost-of-living AI tool benefiting 500+ international students, using Generative AI and interactive NLP techniques.
- Tools: Streamlit, Gemini API, LangChain.

Deep Reinforcement Learning for Robust Spacecraft Rendezvous Guidance

- Implemented Deep Deterministic Policy Gradient (DDPG) algorithms for autonomous spacecraft guidance, achieving a 20% boost in reliability.
- Tools: Python, TensorFlow, OpenAI Gym.

Flight Fare Prediction API

- Developed an end-to-end project to predict domestic flight prices in India using Random Forest and XGBoost regressors with 85% accuracy, deployed as a Flask web application on Render, further integrated to Azure cloud services for scalability.
- Tools: Python, Flask, Azure Web App, Render.

PUBLICATIONS

Koopman Expectation-Based Guidance for Spacecraft Rendezvous and Proximity Operations Under Uncertainties, Arora L., Ulrich S. January 2025

35th AAS/AIAA Space Flight Mechanics Meeting

 Developed an optimization framework using Koopman Expectation for spacecraft trajectory planning under uncertainty, reducing expected squared miss distance and ensuring <1% collision probability. Leveraged numerical simulations and probabilistic modeling to enhance guidance precision and robustness.

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January 2020

Applied ML Researcher

Reinforcement Learning for Sequential Low-Thrust Orbit Raising Problem, Arora L., Dutta A.

30th AAS/AIAA Space Flight Mechanics Meeting in conjunction with the AIAA Science and Technology Forum and Exposition (SciTech 2020)

• Developed a reinforcement learning algorithm, Deep Q-learning to be more specific, using MATLAB for optimal tuning of the weights of the objective function for the electric orbit-raising problem of the spacecraft. Best MSE: 0.0025.

Objective Function Weight Selection for Sequential Low-Thrust Orbit-Raising Optimization Problem, Dutta A., Arora L. January 2019

29th AAS/AIAA Space Flight Mechanics Meeting

 Explored the impact of weights the objective function components on the optimality gap of computed orbit-raising trajectories, and numerical examples based on a variety of orbit-raising scenarios are used to illustrate this effect.

CERTIFICATIONS

Google Cloud - Introduction to Generative AI

 Completed a microlearning certification on Generative AI, covering its fundamentals, applications, and distinctions from traditional machine learning. The course included practical training on using Google tools to develop Generative AI applications.

Business Analytics Course by IMS Proschool

 Acquired a deep understanding of the fundamental concepts and tools of Business Analytics to communicate data insights to stakeholders using visualizations, dashboards, and reports.

IBM Data Science Professional Certificate

 Included 9 courses with latest job-ready skills and techniques covering a wide array of data science topics including: open source tools and libraries, methodologies, Python, databases, SQL, data visualization, data analysis, and machine learning.

December 2019

December 2020

November 2023