Contact

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Top Skills

LangChain

Large Language Models (LLM)

Retrieval-Augmented Generation (RAG)

Honors-Awards

Judge's Choice Award

Aparajit Gnanasekaran

Machine Learning Engineer, Data Scientist and Research Assistant

Edmonton, Alberta, Canada

Summary

I'm a ML/AI Engineer with over 4 years of experience developing and deploying AI/ML solutions across startups, academia, and industry.

I've built and fine-tuned production-grade ML models for tasks like seismic imaging, document parsing (OCR + NLP), RAG Document Retrieval and chaos detection in plasma physics, often working with cloud-based tools like AWS and containers like Docker.

Recent work includes contributing to a computer vision + NLP tool that extracts structured information from unstructured pipeline documents in the Oil & Gas industry, enabling faster and more accurate asset tracking.

I'm passionate about scalable AI systems, model evaluation, and bringing ML prototypes into real-world impact. Currently seeking opportunities to build LLM-integrated products and ML pipelines in fast-moving, mission-driven environments.

Technical Skills: Langchain, Python, PyTorch, Tensorflow, scikit-learn, OpenCV, AWS, Docker, Git, REST APIs
Areas of Focus: NLP, LLMs, MLOps, Cloud ML, Agentic AI

Experience

Hyfold Technology Corp.

Machine Learning Researcher

October 2024 - Present (10 months)

Calgary, Alberta, Canada

Simulate the operation of plasma pulse seismic imaging devices and build machine learning/AI tools for imaging purposes in the Alberta oil sands.

Building various configurations of seismic imagine device chambers using CAD software.

Developed and trained Machine Learning/AI models to enhance seismic imaging performance, optimizing device parameters for field operations, resulting in improved imaging accuracy.

Simulated the operation of seismic imaging devices using OpenFOAM CFD and Finite Element Solvers, identifying optimal configurations to enhance sub-surface seismic imaging, improving operation efficiency.

Hofintech

Machine Learning Engineer

April 2024 - November 2024 (8 months)

Implemented data pipelines using Python & AWS SDK to process thousands of technical documents.

Developed and trained Machine Learning models using AWS CustomLabels Rekognition API and OpenCV for object detection, enhancing pipeline document parsing accuracy.

Built and trained Machine Learning models using AWS Textract API for text recognition, improving pipeline and field equipment number tags extraction efficiency.

Collected and labeled pipeline drawings, preparing data sets for training and testing, resulting in a increase in model training accuracy.

Collaborated with cross-functional teams to integrate ML predictions into client-facing applications

University of Alberta

3 years 6 months

Research Assistant

September 2020 - June 2023 (2 years 10 months)

Edmonton, Alberta, Canada

I delved deeper into understanding plasma experiments by applying non-linear time series analysis, which helps unravel the complexities of chaotic heat transfer. My research involved closely examining the fluctuations in plasma current and voltage to shed light on the chaotic behaviors of transport mechanisms, particularly emphasizing the filamentary formations at the edges of plasma confinement devices.

Leveraging chaos theory and CH-Planes, I crafted models to accurately represent the chaotic heat transfer in plasma, offering a new perspective on its intricate dynamics.
Some of my achievements here were:

Developed and implemented ML models using Python and PyTorch, enhancing predictive analysis of chaos in plasma transport, improving model accuracy.

Applied statistical learning and supervised ML for system characterization.

Developed ML models to identify transition thresholds in experimental datasets.

Authored and published comprehensive thesis detailing findings and methodologies related to chaotic heat transport in plasma.

Processed and analyzed extensive data sets, each exceeding 10GB, to support research findings and model accuracy.

Delivered keynote research findings to department faculty, enhancing academic collaboration and knowledge sharing.

Conducted specialized guest lecture at University's Theoretical Physics Institute, fostering interdisciplinary dialogue.

Teaching Assistant
September 2020 - December 2022 (2 years 4 months)

Orchestrated and facilitated educational sessions alongside lead educator, addressing learner inquiries and coordinating office hours, enhancing student engagement.

Directed undergraduate laboratory courses as chief educator, improving lab efficiency by through structured lesson plans and hands-on activities.

Evaluated and marked student assignments and examinations, ensuring academic integrity and maintaining a high standard of education.

Research Assistant
January 2020 - August 2020 (8 months)

Edmonton, Alberta, Canada

Spearheaded comprehensive analysis of plasma fluctuations, discerning chaotic heat transport characteristics under Dr. Richard Sydora's guidance.

Implemented advanced statistical algorithms in MATLAB, scrutinizing extensive plasma current and voltage data sets, improving data analysis precision.

Cultivated expertise in computational physics by focusing on algorithmic analysis of plasma data, leveraging Python libraries (numpy, pandas, matplotlib) for predictive analysis.

Undergraduate Physics Society, University of Alberta

President

January 2018 - December 2018 (1 year)

Edmonton, Alberta, Canada

I took the lead in organizing social events to strengthen the bond within our academic community, involving both students and faculty. I kicked off welcoming sessions for new students to help them connect with our professors. I arranged various activities, from game nights and research showcases to end-of-year festivities, all aimed at boosting community involvement.

I also had the chance to coordinate visits from distinguished guest speakers, adding value to our educational journey. Moreover, I oversaw the physics student lounge, making sure it was a well-equipped space with study materials, snacks, and leisure options.

A few of my accomplishments here include:

Orchestrated social gatherings to enhance community engagement and camaraderie among students and faculty.

Led and organized diverse events, including games nights, research presentations, and year-end celebrations, enhancing community engagement and camaraderie among students and faculty.

Represented undergraduate physics students' interests to the Department of Physics and Faculty of Science through periodic meetings and detailed reports, fostering effective communication and advocacy.

Coordinated visits by renowned guest speakers for departmental events, enriching academic opportunities and promoting interdisciplinary dialogue.

University of Alberta

Research Assistant
May 2017 - August 2017 (4 months)
Edmonton, Alberta, Canada

Developed innovative computational tools utilizing MATLAB to analyze plasma fluctuation data, advancing statistical analysis methodologies.

Spearheaded project under Dr. Richard Sydora's guidance during internship, improving research methodologies and data analysis precision.

Leveraged MATLAB for advanced statistical algorithms, contributing to the enhancement of plasma fluctuation data analysis.

Education

MIT IDSS
Data Science and Machine Learning: Making Data-Driven Decisions, Data Science · (January 2024 - May 2024)

University of Alberta
Master of Science - MS, Plasma and High-Temperature Physics · (September 2020 - June 2023)

University of Alberta
Undergraduate, Physics · (2015 - 2019)