

ANKUSH ARORA

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EDUCATION

Indian Institute of Technology Delhi

Bachelor of Technology (B.Tech.) in Mechanical Engineering (GPA: 8.55/10.00)

Hauz Khas, New Delhi, India

July 2019 – June 2023

WORK EXPERIENCE

Bajaj Auto Limited

Akurdi, Pune, Maharashtra, India

Assistant Manager, AI & Vehicle Dynamics Integration, Research and Development

July 2023 – Present, Full-time

- **Architected RAG-Based RCA System:** Deployed a local Retrieval-Augmented stack (LangChain, Llama-3 vLLM, FAISS) to mine and index a decade of vehicle test, simulation, and inference data for Root Cause Analysis (RCA), reducing investigative TAT by **20%** and improving FMEA closure.
- **Engineered ML Surrogate Models for MBD:** Built and validated regression-based ML surrogates (scikit-learn, PyTorch) to emulate Adams MBD outputs, accelerating inference for parameter sweeps and DOE—enabling near-instant chassis, steering, and suspension optimization (33% faster loops).
- **Automated Outlier Detection in V&V Pipelines:** Deployed semantic similarity search (FAISS), text embeddings (Hugging Face), and RAG analytics to flag anomalous Adams results during virtual verification (V&V), elevating defect detectability by **18%** and reducing manual review dependency.
- **Data-Driven KPI Dashboards:** Developed interactive Streamlit dashboards (Python, Pandas, Plotly) to empower non-ML users with automated KPI computation (Steering Returnability tuning), anomaly heatmaps, and time-series visualizations, democratizing analytics across R&D cohorts.
- **LLM-Driven Scripting Automation:** Fine-tuned CodeLlama using parameter-efficient LoRA adapters on custom Adams scripting datasets to enable high-fidelity, NL-to-code translation for simulation automation (40% reduction in e2e latency) and enhanced cross-domain downstream CAE tasks.

Colonist LLC

United States (Remote)

QA Automation Engineer

January 2023 – June 2023, Part-time

- **Automated Regression & NLP Defect Detection:** Boosted overall test execution throughput by **30%** and reduced average issue resolution time by **25%**, leveraging Selenium 4.x and pytest-driven UI/API automation alongside integrated, production-grade **spaCy**-powered NLP log parsing workflows.
- **CI/CD Pipeline Integration:** Automated rigorous Jira QA syncs via Jenkins, GitHub Actions, achieving **20%** DF increment.

McGill University

Montréal, Québec, Canada

ML Research Intern, Computational Biology, Guide: Prof. Adam Hendricks

May 2022 – July 2022, Full-time

- **Embedding-Driven Optimization:** Applied SBERT sentence-transformers to semantic protein similarity search pipelines, optimizing large-scale retrieval workflows and improving match accuracy by **15%** over baseline sequence alignment methods in production environments.
- **Bio-Data ETL Automation:** Batched high-throughput metadata ingestion from public APIs (NCBI, UniProt) handling **500K+** records/day.
- **BERT Biomedical NER:** Fine-tuned domain-specific Hugging Face BERT, achieving precision/recall of **88%/85%** on labeled text.

TECHNICAL SKILLS

Languages: Python, C++, Java, SQL, MATLAB

ML/DL Frameworks: scikit-learn, TensorFlow, PyTorch, Keras, Hugging Face Transformers

AI/ML Tools: Pandas, NumPy, OpenCV, spaCy, FastAPI, MLflow, ONNX, Weights&Biases

DevOps/MLOps: Docker, Kubernetes, AWS SageMaker, Azure ML, CI/CD (Jenkins, GitHub Actions)

Data Engineering & Visualization: Apache Airflow, Spark, MongoDB, Matplotlib, Seaborn, Dash, Tableau

PROJECTS

Discrete Simulation Optimization for ML Hyperparameter Tuning | 🧠

(August 2022 – May 2023)

- **Optimization Performance:** Developed scalable, high-efficiency Python-based stochastic optimizers for automated ML hyperparameter tuning, significantly reducing simulation tuning latency by **30%** in complex, large-scale high-dimensional discrete search spaces (**20+** parameters).
- **Algorithmic Robustness:** Engineered and rigorously validated advanced **AHA & SR methods** with statistically significant gains over strong baselines on WDBC (**0.89 MCC**, $p < 0.01$ t-test), enabling balanced classification in robust simulation-driven optimization workflows.

Segregated Distribution of Variable-Length Boxes on Conveyors | 📦

(October 2022 – November 2022)

- **Precision Control:** Engineered advanced, production-grade SFC-driven PLC logic in Automation Studio, achieving conveyor speed accuracy gains of **15%** and reducing sorting faults by **20%** through intelligent multi-sensor integration and adaptive, dynamic load adaptation algorithms.
- **Real-Time Actuation:** Modeled and implemented robust electro-pneumatic automation with responsive, real-time programmable control logic, increasing workflow efficiency and significantly boosting overall system stability in automated, variable-load material handling operations environments.

ACHIEVEMENTS

MITx MicroMasters: Successfully passed 5/6 courses for the SCM MITx MicroMasters on edX

(2023–2024)

MITACS GRI: Selected among top **1%** for undergraduate research in Canada (10,000+ applicants)

(2022)

Teaching Assistant at IIT Delhi: Offered assistantship for course of 400+ students

(2022)

Department Change at IIT Delhi: Opted department change among top **9%** in batch of 1000+

(2021)

Joint Entrance Exam: Secured AIR **67** in JEE Main Paper II and top **0.2** percentile in JEE Advanced with 1M+ candidates

(2019)