# Abhishek Rajgaria

abhishek.rajgaria@utah.edu | +1 (801)-661-4500 | abhishekrajgaria.github.io | linkedin/abhrajga | Salt Lake City, Utah

## Education

**University of Utah** Salt Lake City, Utah, USA

*MS. Computer Science, (Graduate Teaching Assistant), GPA: 3.96/4.0* 08/2023 - 05/2025

*Coursework - Distributed Systems, Natural Language Processing, Advance Artificial Intelligence, Manage Data for ML*

**Indraprastha Institute of Information Technology Delhi** (IIITD) Delhi, India

*BTech, Computer Science with Applied Mathematics (Honors), GPA: 8.72/10* 08/2017 - 06/2021

*Coursework - Data Structure & Algorithm, Object Oriented Programming, Machine Learning, Computer Vision, Databases*

## Skills

**Programming:** Python, Go, Java, C++, C#, JavaScript, TypeScript, SQL

**Frameworks & Libraries:** Pytorch, TensorFlow LangChain, Spring Boot, React, Express.js, Django, Kafka, Spark

**Databases & Cloud:** AWS, MySQL, PostgreSQL, MongoDB, Redis, Elasticsearch, ChromaDB

**Tools:** Git, Jenkins, Linux, Grafana, Kibana, Docker, Kubernetes, Selenium

## Work Experience

**Graduate Researcher, Coral Lab** 06/2024 - Present

- Generated a **map-based** QA benchmark with 1000 questions for USA, India and China using Plotly, revealing a **20-50%** performance gap in **vision-language models** and identifying **hallucination** tendencies in counterfactual scenarios.
- Research in colaboration with **UPenn**, **nominated for Best Paper**, Accepted at **NAACL'25** main conference. (arxiv)
- Innovating a **adaptive prompting technique** leveraging contextual and tabular data to improve on 8 Tabular QA tasks.

**Associate Software Development Engineer, Publicis Sapient, Gurugram** 08/2021 - 08/2023

- Engineered **invoicing and customer onboarding microservices** for a NeoBank using GraphQL and Spring Boot, facilitated reliable **asynchronous messaging** using kafka and delivering robust Unit, E2E and Integration tests.
- Constructed front-end for **student onboarding platform** for 270K+ classrooms, Leading the integration of FE with GraphQL APIs, Apollo Client caching, and **multilingual localization** for 2 languages using react-i18next.
- Designed an **advanced filter and comparison** page for a vehicle eCommerce platform, implementing **Rest APIs** with encrypted data. Deployed using AWS and Terraform with a **blue-green** deployment strategy, ensuring 100% uptime.

**Researcher - Data Science, Midas Lab, IIIT-Delhi** 06/2021 - 08/2021

- Refined **OCR errors** in 7M legal documents, reducing missed citations (15%), we extracted unmarked citations using **NER** and **regex** and implemented multiprocessing for querying **Elasticsearch-indexed** database.
- Achieving a 60% rectification rate and a 100x speedup compared to Pandas-based querying. Dataset from case.law

## Projects

**Product Recommendation using Neuro Symbolic Machine Learning** (Github Link)

- Applied 3 Approaches based on user purchase history and reviews from **Amazon review** dataset on few specific domains.
- **Data augmentation** (8%) with co-purchased items (**Apriori** algorithm), adding **logic constraint as a loss function** (Contrastive loss), and implementing architectural changes using a **hierarchical prediction** method with masking.

**Data Cleaning using LLM** (Github Link)

- Worked on large tabular **data imputation** using textual documents, **fine-tuning** T5-large with QA pairs extracted from **functional dependencies** in high-confidence rows. Stored embedded documents in **Chroma DB**.
- Retrieved data using **RAG methodology**, comparing the outputs of two options with an LLM, gained 72% improvement.

**Distributed Consensus and Fault Tolerent key value store - Raft in Go** (Github Link)

- Implemented Raft-based **leader election**, **log replication**, and persistence ensuring **fault tolerance** and **state recovery** with 4s leader fail over and 5-6 RPCs/sec heartbeats.
- Built **linearizable** key-value store supporting 3 operations: Put, Append & Get with Goroutines for efficient performance.

**Subgraph Isomorphism using Graph Neural Networks** (B.Tech Thesis)

- Conceptualized **attention-based graph pooling** and **interactive context layer** to extract relative node information.
- Applied **Convolutional Neural Networks** and **Neural Tensor Networks** to compute similarity, achieving up to a **10%** improvement in accuracy, precision, recall across diverse datasets in comparison to **Siamese Networks**.