

# AYUSHI NIRMAL

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## EDUCATION

### Master of Science in Computer Science with Thesis

Arizona State University (ASU), Tempe, AZ

May 2024

GPA: 3.87/4

### Bachelor of Technology in Electronics and Communications with Honors

Indian Institute of Information Technology, Allahabad

May 2019

GPA: 8.83/10

## TECHNICAL SKILLS

**Programming Languages:** Python, Java, C++, R, MATLAB, JavaScript.

**Machine Learning & AI:** Generative AI, LLM Fine-tuning, NLP, Information Retrieval, Intent Classification, Data Mining, Entity Recognition, Ranking Algorithms, Distributed Data Processing, LangChain, LlamaIndex, Hugging Face.

**Data Analysis & Frameworks:** Pandas, NumPy, PyTorch, Spark, Hadoop MapReduce, Hive, Impala, NetworkX, RAG, OpenAPI, Microservices, Spring Boot, MVC, Hibernate.

**Tools & Platforms:** Kubernetes, Docker, AWS, Postman, Git, Bitbucket, SQL, MongoDB.

## EXPERIENCE

### Bear River Associates, Oakland, CA, USA: AI Developer

June 2024 – Present

- **Led end-to-end development and deployment of GenAI and ML solutions**, owning the full lifecycle from architecture and model integration to MLOps, vector indexing (FAISS), and AWS-based production deployment—driving innovation in customer support and logistics automation.
- **Built and deployed a GPT-4 powered RAG system** using **LangChain**, **OpenAPI docs**, **SQL agents**, and **FAISS** to automate customer support—reducing response time by **40%** and cutting support queries by **30%**.
- **Designed and launched a real-time Slack bot from scratch**, enabling conversational delivery updates with **<100ms** latency; deployed in **production** on **AWS**, the bot improved **customer satisfaction** by **15%**.
- **Engineered high-accuracy OCR pipeline** using **Fast R-CNN**, **YOLOv8**, **Layout Parser**, and **Tesseract**—boosting document processing accuracy to **85%**, cutting runtime to **2 seconds**, saving **\$100K** annually by eliminating third-party OCR tools.
- **Fine-tuned a LLaMA-based dev assistant** to help engineers navigate and query a legacy Java ORM stack (pre-Hibernate), supporting internal Q&A and code understanding.

### DMML, ASU, Tempe, USA: Graduate Researcher

January 2023 – May 2024

- Evaluated **ideological bias** in **political content** using **SVM**, **Logistic Regression**, and **BERT** on tweets from **Left**, **Right**, and **Neutral** sources, revealing a **28% accuracy drop across spectrums**, emphasizing need for robust debiasing in NLP.
- Analyzed **Covid-19 vaccine biases** by crawling **500+ tweets** using **Tweepy**, **Pandas**, and **NetworkX**, revealing smaller, **dispersed clusters for true information** versus rapid, **large-scale propagation of disinformation**, highlighting critical social media dynamics in **bias amplification**.
- **Developed a red teaming framework** to uncover safety risks in GenAI systems through simulated attacks like **prompt injection** and **harmful completions**; paired with **RLHF-style feedback** loops to iteratively improve model responses and strengthen **safeguards** for **responsible deployment**.

### Citicorp Services India Pvt. Ltd., Pune, India: Associate Software Developer

July 2019 – July 2022

- Designed and implemented a **Monte Carlo simulation-based PoC model** to modernize legacy **XVA engine**, significantly **enhancing exposure estimation accuracy** and **risk stratification**; reduced reconciliation time and improved reliability of **CVA** reporting for **Credit Risk** team.
- **Led backend development of a risk assessment platform** for market teams using **Apache Kafka** and **Spring Boot**, enabling **real-time computation of Counterparty Risk** and generation of **CVA/B3 metrics at 0.29 trades/second**.
- **Built scalable data pipelines** to ingest and transform market data for real-time risk analysis, and collaborated with DevOps to **containerize services using Docker**, reducing **deployment time by 20%**, improving **system reliability by 30%**.

## PUBLICATIONS AND CONFERENCES

- **“Towards Interpretable Hate Speech Detection using Large Language Model-extracted Rationales” [NAACL, 2024]:** Developed an **interpretable** hate speech detector, **SHIELD** using **LLM-extracted rationales** crucial for transparent content moderation enhancing transparency and retaining performance across multiple benchmark datasets with minimal accuracy trade-off. <https://arxiv.org/abs/2403.12403>
- **“Disinformation detection: An evolving challenge in the age of llms” [SDM, 2024]:** Enhanced LLM-generated disinformation detection accuracy by 62.5% using advanced prompts, addressing critical detection failures and bias issues in existing models. [arXiv:2309.15847](https://arxiv.org/abs/2309.15847)

## RELEVANT PROJECTS

- **miniGPT:** Reimplemented a **GPT-style transformer from scratch in PyTorch**, gaining hands-on experience with attention mechanisms, autoregressive token generation, and causal masking—demonstrated end-to-end training on custom tokenized datasets to gain deep understanding of LLM internals.

## AWARDS AND ACCOMPLISHMENT

**Copper Award:** Recognized for contributions to **Internal Audit team**, driving a remarkable **10x** increase in throughput.

**Gold Award:** Reward from **Simpliciti** team for outstanding delivery of **EMM products** into production.