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# Jai Joshi

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## Education

**Georgia Institute of Technology** Aug 2023 – May 2025
*Master of Science, Computer Science, Atlanta, Georgia* ***GPA: 3.88/4.00***
- **Coursework**: Conversational AI, Efficient ML, Human and Machine Learning, Big Data Systems, Computer Vision

**Sardar Patel Institute of Technology** Aug 2019 – May 2023
*Bachelor of Technology, Information Technology, Mumbai, India* ***CGPA: 9.72/10***
- **Coursework**: Data Structures, Algorithms, Advanced Database Management Systems, AI, Distributed Systems

## Skills

**Tools & Languages**: Python, C++, Java, JavaScript, SQL, Dart, TypeScript, Git, AWS, Docker, Google Cloud, Apache Spark
**Frameworks & Libraries**: React, Node, Express, DynamoDB, Flask, CUDA, FastAPI, Redis, PyTorch, TensorFlow, Scikit-learn

## Work Experience

**MicroStrategy** Tysons Corner, Virginia
*Software Engineer Intern* *May 2024 – August 2024*
- Implemented auto-completion feature for search engine within MicroStrategy's analytics platform utilizing **vector space embeddings** and efficient **in-memory indexing** (using Faiss) to accelerate and refine query suggestions
- Enhanced **search response times** by **20x** using a caching mechanism to preemptively retrieve and validate SQL from semantically similar past inquiries, ensuring accuracy and faster responses
- Developed a Cube recommendation engine using **Retrieval-Augmented Generation (RAG)** for efficient metadata management, facilitating precise Cube identification to power MicroStrategy's Auto Dashboard and BI features
- Authored an API in Spring Boot for the telemetry service, enabling secure data retrieval between two microservices (**PostgreSQL**)
- **Technologies:** PostgreSQL, Faiss, TypeScript, Spring Boot, Azure, LLMs, **AWS**, **Microservices**

**PricewaterhouseCoopers LLP** Mumbai, India
*Software Engineer Intern* *Jan 2022 – Jun 2022*
- Spearheaded Oracle ERP implementation projects, demonstrating adept management of BI reporting systems for generating and scheduling reports. Streamlined Oracle HCM extracts to facilitate seamless auto data migration
- Engineered intricate technical OIC integrations, resulting in a remarkable 10% surge in automation of client-side processes
- Assessed crucial performance metrics on an ad-hoc basis, using cutting-edge big data analytics tools such as PowerBi
- **Technologies:** Java, MySQL, Oracle ERP Implementation Tools

## Projects

**Multi LLM Agent Debate Network** — *vLLM (Inference Optimization), LangGraph, Parallel Computing*
- Designed multi-agent collaboration using LangGraph to improve LLM decision-making and coordination to predict cognitive presence in MOOC forums and achieved **90% accuracy**, boosting instructor feedback quality
- Optimized inference through **dynamic few-shot prompting**, **quantization**, **multi-GPU parallelism**, and **vLLM-based enhancements**, achieving a **10x** speedup.

**Distributed Key-Value Store with Fault Tolerance** — *Distributed Systems, RAFT Consensus, Scalability & High Availability*
- Designed and implemented a **fault-tolerant** distributed key-value store by integrating the **RAFT** consensus algorithm to maintain data consistency across replicated state machines
- Developed a sharded architecture to enhance **scalability** and **high availability**, incorporating versioning and cross-shard transactions using optimistic concurrency control (OCC)

**Global-Dynamic Filter Pruning** — *PyTorch, CUDA, Pruning, CNN Model Compression*
- Optimized CNN models by reducing storage size by **70%** and response time by **60%** through global & dynamic unsalient filter pruning scheme, quantization, custom **CUDA** kernels, and **PyTorch bindings**, maintaining testing accuracy

**KGInPaint: Image Inpainting with Interactive Scene Graphs** — *Huggingface Transformers, Scene Graph Generation (SGG)*
- Architected an interactive dashboard for KGInPaint, allowing image uploads, scene graph interaction, and object removal or replacement with in-painted results
- Designed a lightweight **Relation Transformer (RelTR)** for efficient triplet detection, outperforming traditional Scene Graph Generation (SGG) models
- Integrated a **DETR-inspired encoder-decoder** for scene graph generation and combined Meta's SAM with **HuggingFace's inpainting model** for high-quality image restoration

**DeCluttering Research Assistant Tool** — *NLP Algorithms, Collaborative Filtering, Browser Extension*
- Created a browser extension, incorporating the REST framework, which operates on 3 core principles: **BERT** algorithm for information summarization, **Latent Dirichlet Allocation algorithm (NLP)** for text classification, and **Collaborative filtering**, leveraging predictive modeling, for recommending relevant articles to expand the user's knowledge

## Research Publications

1. Cataract Detection by Leveraging VGG-19 Classification Model on Retinal Images (2022, 13th ICCCNT)
2. Sign Language Certification Platform with Action Recognition using LSTM Neural Networks (2022, IC3SIS)