Avijeet Shil

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https://github.com/avijeetas   Google Scholar/Avijeet Shil

Summary

PhD Candidate in Computer Science at the University of North Texas specializing in Large Language Models, Distributed Systems, and AI-driven Retrieval. Experienced in developing scalable ML pipelines, automating data workflows, and optimizing algorithms for search and recommendation systems. Proficient in Python, C++, and Java with strong foundations in data structures, algorithms, and software design.

Education

University of North Texas   Expected 07/2027
PhD in Computer Science (GPA: 4.00 / 4.00)   *Denton, Texas*
- **Research Domains:** Large Language Models (LLMs), Biomedical Relation Extraction, Multimodal Retrieval, Knowledge Graphs, Graph-based RAG, Query Understanding

University of North Texas   Expected 12/2025
Masters in Computer Science (GPA: 4.00 / 4.00)   *Denton, Texas*
- **Relevant Coursework:** Data Structures, Machine Learning, Deep Learning, Natural Language Processing, Big Data, AI, Algorithms, Software Engineering

Experience

University of North Texas   06/2025 – 12/2025
Graduate Research Assistant   *Denton, Texas*
- Conducted research on **graph-based retrieval and LLM-driven GraphRAG**, designing scalable algorithms that improved retrieval relevance by **15%** for large-scale search systems
- Developed **ESAQueryRank**, optimizing semantic query interpretation and improving **MRR by 480%**, while reducing model latency from **5s → 1s**.
- **Automated data preprocessing** for biomedical relation extraction using Python, processing **500K+ documents/day** and increasing throughput **3×**.
- Built components for **semantic ranking, coreference resolution**, and **content understanding**, aligned with distributed AI system design.
- Collaborated with cross-functional research teams to **test, debug, and deploy** efficient ML pipelines.

Vivasoft, Fintech Platform   11/2022 – 08/2023
Software Engineer I   *Dhaka, Bangladesh*
- Modernized system architecture by migrating from monoliths to **microservices**, improving scalability by **40%** using Docker/Kubernetes—experience relevant to large-scale ML infrastructure.
- Built **AI-driven monitoring pipelines** enabling **99.99% uptime**, demonstrating production-grade ML system reliability.

Reve Systems   06/2021 – 10/2022
Software Engineer   *Dhaka, Bangladesh*
- Designed document processing workflow with interactive interface, reducing report creation time by **85**% and processing 500+ daily reports with **99.99**% accuracy.
- Integrated NLP-based duplicate question detection tool, achieving **98**% accuracy and 150ms inference speed, reducing redundancy by **80**%.

Technical Skills

Languages: Python, C++, Java, JavaScript
AI & NLP: Large Language Models (LLMs), GraphRAG, RAG, Transformer Models (BERT, GPT, BART), Multimodal Retrieval, Conversational AI, Query Understanding, Knowledge Graphs, Graph Neural Networks (GNNs)
Frameworks & Tools: PyTorch, TensorFlow, Hugging Face, LangChain, LangGraph, FastAPI, Scikit-learn,
Distributed Systems: Hadoop, MapReduce, GPU Computing, Scalable Pipelines
Infrastructure & DBs: Faiss, Supabase, Docker, Kubernetes, AWS, GCP, Azure, Redis, PostgreSQL
Other: Algorithm Design, Data Mining, Scalable Systems, Collaboration, Problem Solving

Project Experience

BlindSpot — Next.js, FastAPI, BART (Hugging Face), Faiss, Supabase, CSS, RAG   04/2025
- Led a team of four to employ a personalized media literacy platform using RAG (Retrieval-Augmented Generation).
- Integrated FAISS + TF-IDF for vector-based semantic article retrieval; BART for abstractive summarization.
- Improved retrieval accuracy by 20% using optimized FAISS-based semantic search.

Publications

- **Shil, A.**, & Jin, W. (2025). SQUIRE+LLM: A LLM-assisted ESA-based unsupervised semantic query interpretation and ranking engine. (Accepted).
- **Shil, A.**, & Jin, W. (2025). ESAQueryRank: Ranking query interpretations for document retrieval using explicit semantic analysis. (Accepted)
- Florescu, C.,**Shil, A.**, & Jin, W. (2025). Keyphrase Extraction using Network Representation Learning. (Under review).
- Florescu, C., **Shil, A.**, & Jin, W. (2024, August). A New Learning-to-Rank Framework for Keyphrase Extraction Using Multi-scale Ratings and Feature Fusion. *In Asia-Pacific Web (APWeb) and Web-Age Information Management (WAIM) Joint International Conference on Web and Big Data* (pp. 63-79). Singapore: Springer Nature Singapore.