Pranav Mishra

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Education

Master of Science, Computer Science [Graduate Assistant] *Aug 2023 - May 2025*
University of Illinois at Chicago, Illinois, USA GPA: 3.6/4.0

Bachelor of Science, Computer Science and Engineering *Aug 2019 - June 2023*
Dayananda Sagar College of Engineering, Bangalore, Karnataka, India GPA: 4.0/4.0

Technical Experience

AI/ML Intern | WheelPrice | Charlotte, NC *July 2025 - Nov 2025*

- Building end-to-end ML prototype for automotive part fitment prediction using PyTorch and computer vision models.
- Deployed production-grade CMS blog system using React TypeScript with Node.js backend, MongoDB database, and RESTful APIs, scaling daily webapp viewership by 10-20k through enhanced content delivery and SEO implementation.

Research Software Engineer | UIC: V-ARE Labs | Chicago, IL *Feb 2024 - July 2025*

- Built virtual patient system using Unreal Engine and C++. Deployed REST APIs with Python backend for data analysis ↗
- Integrated LangChain & PostgreSQL to build a full-stack virtual avatar platform on Azure cloud services, enabling users to create custom RAG systems with one-click deployment using React/JavaScript frontend and Cosmos DB vector database. ↗

Research & Publications

TeamMedAgents: Enhancing Medical Decision-Making of LLMs Through Teamwork *GitHub| DOI/arXiv*

- Developed systematic multi-agent collaboration framework in Python translating organizational teamwork principles into LLM-based medical reasoning systems with dynamic agent recruitment algorithms, and Azure cloud deployment.
- Achieved superior performance across 7/8 medical datasets through systematic ablation studies. [AAAI 26 submission]

Projects

SnakeAI-MLOps: Multi-Agent Reinforcement Learning Snake Game *GitHub | Demo*

- Built C++ game with SFML and LibTorch, implementing MLOps pipeline with 4 RL algorithms, model comparison tools, and CI/CD deployment with Docker containerization achieving 5x training speedup through CUDA optimization.

Automating Prompt Generation for Training-Free Object Segmentation in PaintSeg *GitHub*

- Developed autoprompting system leveraging computer vision techniques with diffusion models and Dense Prediction Transformer fine-tuning, PostgreSQL database for automated data annotation.
- Achieved 5.5% intervention in IOU score, deploying MLOps pipeline with Kubernetes orchestration.

MetaRAG: Enhancing Document Retrieval with LLM-Driven Metadata Enrichment *GitHub*

- Architected end-to-end metadata enrichment framework for RAG systems using LangChain & Pinecone database.
- Delivered 92.5% precision and 25% hallucination reduction through hybrid search algorithms & custom retrievers, deploying scalable Linux infrastructure with CI/CD pipeline on Azure cloud Services.

Reproduced InBedder Text Embedding: Answer is All You Need *GitHub*

- Reproduced ACL research implementing Inbedder text embedders using TensorFlow and PyTorch for NLP applications.
- Evaluated performance across 7 benchmark datasets ETL pipelines using Node.js backend and MongoDB database.

Skills

TECHNICAL SKILLS: Python, C++, JavaScript, C#, TensorFlow, PyTorch, MatLab, Pandas, LangChain, React, NumPy, Node.js, Flask, Next.js, Django, FastAPI, PostgreSQL, MongoDB, Docker, Git, GCP, Azure, AWS, DevOps, REST APIs

APPLICATIONS: Machine Learning, Deep Learning, NLP, Computer Vision, Neural Networks, Transformers, Data Science, MLOps, Cloud Computing, Agile Development, Linux, Fine tuning, Data structures, Mathematics, Version Control

Extracurricular

Winner of MIT XR Hackathon | Built Meta Quest 3 app using Unity and Hugging Face for spatial data visualization ↗

INFORMS Analytics+ Presented MetaRAG research to 700+ professionals | First place HINT 5.0 Web3 virtual museum ↗

Explore my portfolio for 25+ innovative projects spanning game design, AI/ML research, and in-development work ↗