Pranav Pushkar Mishra

773-280-4615 | pmishr23@uic.edu | LinkedIn / pranavgamedev | Github / PranavMishra17 | Portfolio

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

UIC: V-ARE Labs | Research Software Engineer *Feb 2024 - Present*

- Architected virtual patient system using Unreal Engine 5 and C++. Deployed REST APIs with Python backend ↗
- Established CI/CD pipeline for research participant testing, enabling 2x faster deployment cycles
- Engineered MedRAG avatar platform with full-stack architecture utilizing React front-end and Azure cloud services ↗
- Integrated LangChain with OpenAI API, implemented PostgreSQL database with vector search for custom RAGs.

Bipolar Factory | Software Developer Intern *March 2023 - May 2023*

- Developed Metawood gamified streaming platform using MERN stack (MongoDB, Express.js, React, Node.js) with TypeScript integration. Established AWS cloud deployment pipeline following Agile development methodologies.
- Built in-game communication systems using C# and Unity, integrating MongoDB with SQL optimization.
- Engineered in-game theater (10% retention increase) with Git workflows, and Quality Assurance testing protocols.

Projects

Big5-Agents: Integrating Teamwork Components into Multi-Agent Systems *GitHub*

- Engineered collaborative multi-agent framework using Python and Azure cloud services for medical QnA applications.
- Optimized system performance through coordinated collaboration algorithms, achieving 93% decision-making accuracy and 15% computational overhead reduction via optimization techniques.

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 mask generation automation.
- Achieved 5.5% intervention in IOU score, deploying MLOps pipeline with Kubernetes orchestration.

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

- Architected production-grade RAG system using LangChain, Pinecone, and Azure cloud services.
- Delivered 92.5% precision and 25% hallucination reduction through hybrid search algorithms & custom retrievers, deploying scalable infrastructure with Kubernetes & Docker containerization.

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

- Reproduced ACL 2024 research implementing instruction-following text embedders using TensorFlow and PyTorch.
- Evaluated performance across 7 benchmark datasets through machine learning classification and clustering, implementing REST API with Node.js backend and MongoDB database for scalable inference deployment.

Extracurricular & Skills

Winner of MIT XR Hackathon | Built Meta Quest 3 app using Unity and Hugging Face for XR planning and design ↗

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

TECHNICAL SKILLS: Python, C++, JavaScript, TensorFlow, PyTorch, LangChain, React, Node.js, Flask, Django, FastAPI, PostgreSQL, MongoDB, Docker, Git, Azure, AWS, REST APIs

APPLICATIONS: Machine Learning, Deep Learning, NLP, Computer Vision, Neural Networks, Transformers, Generative Models, MLOps, Cloud Computing, Agile Development, Fine tuning