Pranav Mishra

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Skills

TECHNICAL SKILLS: C#, C++, Unity, Unreal Engine, GLSL, OpenGL, Vulkan, Python, JavaScript, React, Node.js, PostgreSQL, MongoDB, Git, Docker, .NET Framework, Flask, Rust, Django, FastAPI, DevOps, Azure, AWS

APPLICATIONS: Game Development, Virtual Reality, Computer Vision, Machine Learning, Object-Oriented Programming, Cross-Platform Development, Performance Optimization, Agile Development, Version Control, Linux

Technical Experience

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

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

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

- Developed data-driven streaming platform using MERN stack (MongoDB, Express.js, React, Node.js) with TypeScript. Established AWS cloud deployment pipeline following Agile methods, Jenkins CI/CD and Linux server management.
- Built in-game chat feature using C#, Unity(10% retention increase), MongoDB & SQL optimization in Metawood. ↗

Projects

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

- 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]

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.

Stellarium: A Space Odyssey - VR Star System ***GitHub | Demo***

- Architected immersive VR educational platform in Unity/CAVE3D system using C# and GLSL shaders, integrating 107k+ star astronomical datasets with Python preprocessing pipelines and real-time constellation mapping algorithms.
- Developed dynamic time simulation features, procedural constellation visualization, and narrative-driven astronomy lessons, achieving 50% performance optimization through GPU instancing and LOD systems.

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

- Architected research-grade RAG system with metadata generation using LangChain, Pinecone, and Azure cloud services.
- Delivered 92.5% precision and 25% hallucination reduction through hybrid search algorithms & custom retrievers, deploying scalable Linux infrastructure with Kubernetes & automated data backup systems. [NeurIPS 2025 Submission]

AgentMafia: Multi-Agent Deduction Game ***GitHub***

- Implemented intelligent gameplay programming through LangChain AI agents with TypeScript/JavaScript optimization, featuring responsive HTML/CSS interface design and scalable API architecture for multi-user interactions.

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

Extracurricular

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 Web3 virtual museum ↗

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