Pranav Pushkar Mishra

Chicago, IL • 773-280-4615 • pmishr23@uic.edu • LinkedIn / pranavgamedev • Github / PranavMishra17 • Portfolio

TECHNICAL EXPERIENCE

UIC College of Applied Health Sciences: V-ARE Labs | *Graduate Assistant* Feb 2024 - Present

- Spearheaded design and development of EQUITY, a virtual patient system in **Unreal Engine 5** with C++ programming, integrating UE5's MetaHuman plugin, **Nvidia Omniverse**, and automated GenAI animation using **REST APIs** and **Python** scripts.
- Implemented gameplay programming and real-time systems with performance optimization, integrating **Azure's** Text-to-Speech and OpenAI for NLP, building **Python/Flask** backend and **JavaScript/React/CSS** frontend with debugging and version control at IVORY.

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

- Contributed to Metawood development using **Unity Engine** with C# scripting and gameplay programming. Assisted in building cross-platform website using **React** and **Node.js** with agile development methodologies.
- Implemented game networking and real-time communication systems using **C++** with networking libraries like **ENet, RakNet**, and **WebSockets**. Developed in-game theater with performance optimization, debugging, and **Quality Assurance** testing.

PROJECTS

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

- Designed VR educational experience in Unity visualizing 107k+ stars with C# scripting and cross-platform development.
- Implemented custom shaders, GPU Instancing, and game mechanics while optimizing runtime performance for VR platforms.

Neon-Bites: Cyberpunk Food Delivery Game | - GitHub | GamePlay

- Developed driving mechanics, gameplay programming, minimaps, NPCs & cityscape with C# & object-oriented programming.
- Integrated game mechanics including customizations, enemies, and power-ups with performance optimization for cross-platform play.

AgentMafia: Multi-Agent Deduction Game | - GitHub

- Developed full-stack implementation with game logic, real-time networking, and version control using React frontend, Flask backend, Azure OpenAI integration with debugging and cross-platform deployment.
- Implemented gameplay programming for AI discussions through LangChain with performance optimization, featuring interactive UI/UX, strategic game mechanics, and object-oriented programming design patterns.

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

- Developed multi-agent framework integrating Big Five teamwork model components inspired by MDAgents for AI agent collaboration with MLOps integration, implementing modular teamwork components with dynamic task handling and specialized agent roles.
- Enhanced multi-agent system performance through coordinated collaboration, improving decision-making accuracy from 80% to 88% while reducing computational overhead by 15%.

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

- Developed an autoprompting computer vision system for PaintSeg using K-means clustering and Dense Prediction Transformer models to automate precise input mask generation & achieved a **72.48%** IOU on the DUTS dataset with model evaluation.

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

- Architected production-grade RAG pipeline using LangChain with systematic LLM-driven metadata enrichment framework for enterprise documentation retrieval and model deployment, achieving 82.5% precision with recursive chunking and TF-IDF weighted embeddings.
- Reduced hallucination rates by 65% through hybrid search combining BM25 dense retrievers and custom prompt engineering, with comprehensive model evaluation using cross-encoder reranking and MLOps practices, representing a 27% improvement over baselines.

EDUCATION

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

Bachelor of Science, Computer Science and Engineering August 2019 - June 2023
Dayananda Sagar College of Engineering, Bangalore, Karnataka, India CGPA: 9.1/10

TECHNICAL SKILLS

Game Development: Unity Engine, Unreal Engine 5, C Scripting, Gameplay Programming, Game Mechanics, Performance Optimization, Cross-Platform Development, Vulkan, OpenGL, Azure cloud servises, AWS
Programming: C, C++, Python, JavaScript, Object-Oriented Programming, Design Patterns, Game Logic, Debugging
Game Systems: Physics, Animation, UI/UX, Networking, Mobile Platforms, Real-Time Systems, Version Control
Version Control & Methodologies: Git, GitHub, PowerShell | Agile, Kanban, Jira
Databases: PostgreSQL, MySQL, NoSQL, Pinecone, Amazon S3, CosmosDB, MongoDB, Redis, CLoudfare
ML Libraries/Frameworks: TensorFlow, PyTorch, Keras, Scikit-learn, OpenCV, LangChain, PySpark, Pandas, NumPy
Libraries/Frameworks: .NET Framework, Flask, Node.js, REST APIs, React, Express.js, Django, FastAPI
Machine Learning & AI: Machine Learning, Deep Learning, Computer Vision, NLP, Transfer Learning, Generative Models, Transformers
Mathematics for ML: Linear Algebra, Probability, Statistics, Calculus, Optimization, Graph Theory, Information Theory, Differential Equations

EXTRACURICULLAR & CAMPUS INVOLVEMENT

Winner of MIT XR Hackathon 2024 | *SnAlder Cut* , a Meta Quest-3 app, utilizing Meshy AI, Hugging face, Unity Engine, Niantic Lightship VPS & Meta Presence platform, demonstrating a tool for pre-production planning of stunts and sequences in film and media.

Presented MetaRAG research on LLM-powered metadata enrichment at INFORMS Analytics+ Conference to 700+ analytics professionals.

Secured first place at HINT 5.0(Hack in the North), April 2022, with an innovative NFT virtual museum concept.