

DHRUV RAJVANSH

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EDUCATION

University of Southern California

Los Angeles, CA, US

Master of Science, Computer Science – 3.67 / 4 GPA

August 2024 - May 2026

Courses: Analysis of Algorithm, 3D Graphics & Rendering, Computer Animation & Simulation, Database System, Engine Development

Pandit Deendayal Energy University

Gandhinagar, Gujarat, India

Bachelor of Technology, Computer Engineering – 3.86 / 4 GPA

June 2020 - April 2024

Courses: Operating Systems, Software Engineering, Big Data Analytics, Cloud Computing, Web Development, Computer Vision, ML

SKILLS

Languages & Scripting: C++, C#, Python, Java, JavaScript, SQL (MySQL, PostgreSQL), NoSQL (MongoDB)

Graphics, GPU & Systems: OpenGL, Vulkan, DirectX 11, GLSL/HLSL, CUDA, GPU Architecture, GPU Compute (HIP, OpenCL), Multithreading, x86 Architecture, Real-Time Systems, Performance Optimization

Autonomy & Simulation: Unity, Unreal Engine, WebGL/WebXR, Simulation Systems, Sensor Integration, Distributed Systems, ROS (familiar)

Infrastructure & Tools: Linux/Unix, Git/GitHub, Perforce, Docker, AWS, Cloudflare, CI/CD, CMake, Visual Studio, VS Code

EXPERIENCE

Software Engineer | USC Institute for Creative Technologies, Los Angeles, CA

July 2025 - Present

- Military Simulation Tool:** Developed an autonomous agent simulation tool with Unity, C#, and WebGL, integrating Cesium heightmaps for high-fidelity operational environments with optimized rendering and browser accessibility.
- VR Training Agent Migration:** Led VITA migration from desktop to Meta Quest 3 using C# and Meta SDK, implementing passthrough, room-scale locomotion, and a desktop-VR pipeline over MQTT for real-time bidirectional agent communication.
- AI Personality Framework:** Engineered AI personality framework with 3-character dispositions (neutral, angry, soft), reducing virtual human initialization delay through optimized prefab container architecture and dynamic cutscene generation

Software Engineer Intern | IDZ Digital Private Limited, India

January 2024 - July 2024

- Mobile Game Prototyping:** Demonstrated quick ideation and execution skills prototyping 13 interactive mobile applications, such as Planet, Car Stacking Snake, and Mandala design, meeting all project deadlines despite strict time constraints.
- Runtime Performance Optimization:** Boosted frame rate by 45% and improved responsiveness by deploying Unity memory management strategies, streamlining asset workflows, and reducing CPU bottlenecks through architectural improvements.

Software Engineer Intern | Vyorius Drone Private Limited, India

June 2023 - August 2023

- Multiplayer Networking Architecture:** Orchestrated and coded real-time communication layers with C#, enabling precise state tracking and real-time multi-user synchronization for a low-latency remote operation across distributed systems.
- Network Latency Optimization:** Improved UI elements including lobby panels and score tracking systems. Engineered networking protocols and state synchronization, reducing network latency by 40% via state sync protocol redesign.
- Mirror API Integration:** Leveraged Mirror API to manage distributed state-sync events, establishing session instancing, secure authority handling, and reliable remote interaction for scalable multiplayer environments.

TECHNICAL PROJECTS & RESEARCH

GPU-Accelerated Particle Simulation & Benchmarking: C++17, CUDA, CMake, Python

- Demonstrated that a fused SoA kernel with coalesced memory access outperforms both naive AoS and unfused SoA designs, quantifying the impact of memory layout and extra global-memory passes on GPU throughput.
- Implemented a block-size auto-tuner (128/256/512), showing optimal launch configuration reduces runtime on large particle counts over a fixed configuration.
- Measured concrete speedups (GPU SoA vs CPU, fused vs AoS) across 1K–100K particles, turning the project into a reproducible GPU performance benchmark.

Real-Time Graphics Engine Development: PrimeEngine – C++, DirectX 11, OpenGL, HLSL, Lua, Python

- Engineered a distance-based mesh LOD system, dynamically swapping high-fidelity meshes with low-poly proxies to reduce draw calls and vertex overhead.
- Implemented temporal skeletal animation optimization modulating skinning update frequency by camera distance, reducing CPU cycles while preserving motion sync.
- Architected modular C++ components for an entity-component system with spatial state queries and real-time debug visualization.