DHRUV RAJVANSH

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EXPERIENCE

Software Engineer | USC Institute for Creative Technologies, Los Angeles, CA **July 2025 - Present**

- **Geospatial Application Development:** Developed interactive military planning tool with Unity, C#, and WebGL integrating Cesium heightmaps to generate high-fidelity operational environments with optimized UI and browser accessibility
- **Virtual Human Modernization:** Led VITA (Virtual Interactive Training Agent) migration from desktop to Meta Quest 3 using C# and Meta All-in-One SDK, implementing passthrough, room-scale locomotion with ground detection, and a dual-window desktop–VR pipeline communicating over MQTT to drive real-time bidirectional agent communication to user actions.
- **Dynamic AI System:** 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**

- **Rapid Prototyping & Iterative Development:** 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.
- **Performance Tuning:** 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 Infrastructure:** 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.
- **User Experience Enhancement:** Improved and Merged UI elements including lobby panels and score tracking systems. Engineered efficient networking protocols and state synchronization, reducing network latency by 40% via state sync protocol redesign.
- **System Integration:** Utilized Mirror API to synchronize distributed state synchronization events, establishing session instancing, secure authority handling, and reliable remote interaction for scalable multiplayer environments.

TECHNICAL PROJECTS & RESEARCH

Directed Research with Professor Scot Easly – C#, Json, Python

- **Data-Driven Framework:** Built UI framework unifying frontend components with backend RESTful APIs, implementing validation logic to ensure data integrity across user sessions.
- **Serialization Pipeline:** Designed high-throughput JSON/C# serialization pipeline optimizing data transfer for real-time analytics and secure state synchronization across distributed clients.
- **Resource Management:** Engineered economics systems with optimized JSON pipelines for real-time wallet state synchronization

Real-Time Graphics Engine Development: PrimeEngine – C++, Lua

- **Discrete Mesh LOD System:** Engineered a distance-based level of detail system for high-polygon industrial assets, dynamically swapping high-fidelity meshes with optimized low-poly proxies to minimize vertex processing overhead and draw calls.
- **Skeletal Animation LOD:** Implemented a temporal optimization technique for character animation that modulates skinning update frequency based on camera distance, utilizing time accumulation to preserve motion synchronization while reducing CPU cycles.
- **Component-Based Architecture:** Architected modular C++ components for the engine's entity-component system, managing spatial state queries and implementing real-time debug visualization to verify performance gains and logic correctness

SKILLS

Programming Languages: C++, C#, Python, Java, JavaScript, JavaScript, HTML5, CSS3, SQL (MySQL, PostgreSQL), NoSQL (MongoDB)
Graphics & AI Frameworks: Unity, Unreal Engine, OpenGL, Vulkan, DirectX 11, WebGL, Three.js, WebXR API
Cloud & Tools: AWS, Azure, Git/GitHub, Visual Studio, Perforce, VSCode
Development Practices: Object-Oriented Programming, Design Patterns, Algorithms and Data Structures, Code Review, Refactoring, Multithreading, 3D Math, Computer Graphics
Soft Skills: Problem-Solving, Teamwork, Leadership, Communication, Time Management, Adaptability

EDUCATION

University of Southern California **Los Angeles, CA, US**
Master of Science, Computer Science – 3.56 / 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