

Zaid Kamil

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PROFESSIONAL SUMMARY

Unity engineer specializing in **3D simulation** for XR and digital twins, with deep hands-on work in **Unity physics system**, constraint-based interaction, and performance tuning across CPU/GPU/memory. Built production C# and C/C++ systems spanning robotics teleoperation, multi-user XR, and IoT-driven real-time visualization—balancing realism, determinism, and maintainability to ship. Strong foundation in **3D math** (vectors, matrices, quaternions, jacobians) and pragmatic engineering judgment around fixed timestep simulation, numerical stability, and architecture in large codebases.

EDUCATION

California State University, Dominguez Hills

M.S., Computer Science

Dec 2025

GPA: 3.90/4.00

Texas A&M University

B.S., Chemical Engineering

Jul 2020

SKILLS

Programming Languages: C++, C#, Python, Java, JavaScript, SQL, HLSL, GLSL

Frameworks & Libraries: Unity Engine, Unreal Engine, OpenXR, Meta Quest SDK, Mixed Reality Toolkit (MRTK), Lens Studio, ROS, WorldViz Vizard, Scriptable Render Pipeline, Shader Graph, Netcode for GameObjects, Stream Analytics, Unity Physics (PhysX), Articulation Bodies, Configurable Joints, Inverse Kinematics (IK), Forward Kinematics (FK), Kinematic Chains, Jacobian IK, Fixed Timestep Simulation, Interpolation/Extrapolation, Solver Iterations & Sub-Stepping, Numerical Stability, Multithreading (Jobs System), Burst (SIMD)

Tools & Software: RenderDoc, Unity Profiler, Memory Profiling, Custom Render Passes, Native C++ Plugins, C# Engine Extensions, Real-Time Graphics, Low-Latency Optimization, Linux, Docker, REST APIs, CI/CD, Jenkins, Data Validation, Git, Cisco, LoRaWAN, Selenium, Playwright, ADB, Jira, Manual & Automated Testing, Regression Testing, Test Case Design, CPU Optimization, GPU Optimization, Memory Optimization, XR Performance Profiling, Frame Debugger, Profiler Markers

Cloud Platforms: Azure IoT Hub, AWS, Google Cloud

WORK EXPERIENCE

z/R Map | Founder & Software Engineer

Sep 2024 - May 2026

- Founded and led a cross functional team of 5, including 2 developers, marketing, and finance, directing product strategy and go to market efforts.
- Presented product roadmap and business impact to stadium facility managers, marketing stakeholders, and potential investors to support fundraising and adoption.
- Performed QA testing of the Azure based IoT data pipeline, validating data integrity and latency from sensor capture through AR/VR headset visualization.
- Engineered custom C# Unity engine extensions for **3D simulation** digital twin stadium visualizations, using the **Unity physics system** for constraint-based interactions and contact realism while keeping maintainable, testable architecture.
- Designed GPU accelerated rendering pipelines in Python, streaming live geospatial data to lower end to end latency by 40% at 90% uptime; profiled **GPU optimization** hotspots and reduced shader/overdraw cost for stable XR framerate.
- Optimized rendering utilizing Scriptable Render Pipeline (SRP) and custom HLSL/GLSL shaders to sustain 90 FPS in real time XR, including targeted **CPU optimization** and **memory optimization** passes to minimize spikes.
- Architected spatial synchronization services using Netcode for GameObjects to maintain stable state replication across 4 VR users, combining client-side interpolation with **fixed timestep simulation** to keep interactions deterministic.
- Captured real time IoT sensor data and visualized it in interactive 3D format on AR/VR headsets, enabling end to end data collection and data capture pipelines for stadium environments.
- Tracked and reported performance and usage metrics across cloud resources (Azure IoT Hub, AWS, Google Cloud) supporting the platform's IoT and rendering infrastructure.
- Conducted performance and regression testing across rendering and synchronization pipelines, validating 90 FPS targets and stable state replication across concurrent VR sessions prior to release; tuned solver iterations/sub-stepping for numerical stability.

Toro Auxiliary Partners | AR/VR Software Engineer

Jul 2024 -

- Developed interactive XR learning applications featuring custom C# Unity plugins for pulley system dynamics, box push force vector visualizations, and spatial physics simulations using the **Unity physics system**.
- Conducted iterative QA testing of physics simulation based immersive learning modules, refining pulley system dynamics and force vector accuracy across development cycles, including parameter sweeps for solver stability.
- Implemented complex **3D math** across a 3,000 line codebase—vectors, matrices, quaternions, and jacobian-based constraint solving—to compute real time raycasting, force vectors, and interactive mechanics.
- Implemented multi-end-effector interaction rigs with constraint-based hand tools using **kinematic chains** plus **inverse kinematics** and **forward kinematics** for believable grasping and object manipulation in XR.
- Built a multiplayer spatial networking service in Unity/C# using Netcode, enabling frame accurate state replication and low latency interaction for up to 10 concurrent users using **fixed timestep simulation** and interpolation.
- Profiled, diagnosed, and improved XR performance using RenderDoc and Unity Profiler (CPU/GPU/memory), resulting in a 70% reduction in frame drops across interactive physics lectures.

MindHome Inc. | Software Engineer Intern

May 2024 - Nov 2024

- Constructed a safety critical VR teleoperation app in native C/C++ (P/Invoke) and C# (Unity, ROS) featuring real time hand tracking and haptic input compliant with OpenXR, bridging real-world robot code into a **robotics simulation** digital twin workflow.
- Performed hardware engineering integrating VR headsets with robotics platforms, including Unitree quadruped robots and Universal Robots robotic arms, for real time teleoperation control and calibration of kinematic constraints.

- Designed automated testing rigs and CI/CD validation tools, elevating automated test coverage to 85% across 5 distinct VR device configurations.
- Programmed cross hardware compatibility interfaces to resolve runtime input differences between HMD peripherals, validating fixes through regression testing and reducing QA debugging time by 50% per release while contributing to a large existing production codebase.
- Implemented kinematic control layers for robot end-effectors using constraint-based chains with **forward kinematics** and **inverse kinematics** (multi-end-effector), tuned for numerical stability and smooth interpolation.
- Optimized real time spatial rendering and hand tracking input pipelines targeting Vulkan and OpenGL ES, lowering overall application input to display latency to under 30ms via targeted **CPU optimization**, **GPU optimization**, and **memory optimization**.

Division of IT, CSUDH | Information Technology Assistant

Feb 2022 - May 2026

- Maintained campus wide network infrastructure across 150+ endpoints supporting hybrid learning, ensuring process compliance while sustaining 90%+ system uptime and resolving defects with a 95% satisfaction rate.
- Performed hardware engineering and used Linux to deploy and maintain servers, manage networking and security configurations, and reimage OS software across campus endpoints.
- Trained college student users on software applications and faculty on classroom IT technology, creating supporting documentation and troubleshooting playbooks.

Qatar Petroleum | Chemical Engineer

Sep 2020 - Sep 2021

- Automated data reporting and metrics workflows while maintaining process compliance in a safety critical plant, saving 20 hours weekly.

Texas A&M University | AR/VR Software Researcher | College Station, TX

Sep 2017 - Jul 2020

Designed and shipped a production C\# and C++ interactive system for Microsoft HoloLens, evaluated across 3 cohorts of 50+ users and achieving a 45\% measurable improvement in outcomes through structured pre/post assessments.

- Built a **3D simulation** rendering system for Microsoft HoloLens with real time 3D compositing and interactive graphics, evaluated across 3 cohorts of 50+ users with a 45% gain in comprehension outcomes; applied **XR performance** profiling and optimization across CPU/GPU constraints.
- Implemented physics-driven interaction behaviors and constraint rigs leveraging the **Unity physics system**-equivalent principles (fixed timestep, solver iterations, numerical stability) to maintain consistent outcomes across devices and sessions.
- Published peer-reviewed systems research at IEEE Virtual Reality Conference presenting architecture design, performance data, and evaluation methodology to an international engineering audience.

PROJECTS

E-Commerce Web Application QA Testing

- Designed and executed Selenium-based automated test suites validating user login and core functionality, including cart and checkout flows, prior to production release.

IoT Data Integration to AR/VR HMD

- Designed a distributed IoT telemetry pipeline (Azure IoT Hub, Stream Analytics, REST APIs) streaming live sensor data into XR environments for sub-second physical-world state visualization on HMD displays.
- Built a Unity digital-twin scene that consumed telemetry into physics-driven components (constraints/joints) to validate **Unity physics system** behavior under real-time inputs, with **fixed timestep simulation** + interpolation for stability.