

Zac Drake

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Software engineer with 20+ years across XR, real-time graphics, and spatial computing — from AAA game development at Activision to Quest VR at Meta to automotive holographic displays. Brings a consistent track record of rapidly ramping to expert level in new technical domains: Vulkan rendering, FPGA digital logic, XR simulation tooling, and AI-assisted development workflows. Deep expertise in Unreal Engine 5, mobile XR, and developer ecosystem support at scale. Previous roles as engineering manager (teams up to 12) delivering AR products for Fortune 500 clients. Fluent with AI development tools including Claude, MyClaw, Codex, and Gemini.

Experience

Meta

London / Los Angeles

June 2020 - Present

Software Engineer - Developer Relations Engineering (*April 2025 – Present, London, UK*)

Platform engineering technical lead for EMEA's Quest developer ecosystem — Meta's largest and most strategic region — providing hands-on engineering solutions to rendering, SDK, and spatial computing integration challenges across Unreal and Unity.

- Act as embedded technical consultant for 11+ developer projects — running weekly syncs, diagnosing engine and SDK issues, and providing hands-on engineering support.
- Delivered critical rendering fixes for Unreal Passthrough (HDR and LDR tonemap subpass) and Unity passthrough layer sorting, directly unblocking developers.
- Authored the Hands Best Practice documentation — compiling SDK availability, engine support, samples, and API details — published on the Meta Horizon developer forums and the public developer portal.
- Established the Android API Level 34 enforcement timeline, coordinating documentation updates, developer blog, store rule changes, and Project Setup Tool rules across cross-functional teams for a March 2026 rollout.
- Built an AI and Dogfooding Dashboard averaging 100+ daily viewers; led AI tool training sessions for 6 cross-functional partners, increasing adoption across the org.
- Designed and deployed shared AI skills to a team platform rather than maintaining bespoke personal workflows — ensuring improvements compound across users rather than individuals.

- Collaborated with cross-functional partners to evaluate and select the first third-party game title for Meta Display Glasses.

Software Engineer - XR Simulator (*July 2024 – April 2025, London, UK*)

Drove architectural direction for XRSim 2.0 — an OpenXR-based XR device simulator — leading Unity client development and delivering milestones that established the technical foundation for the broader team's 2025 roadmap.

- Launched XRSim 2.0, delivering +44% tool session depth, +17% day-1 retention, and over 400 hours of developer downtime eliminated per release cycle.
- Designed and implemented gRPC client services (graphics, device, and info) providing the communication backbone between the new XRSim frontend and the native backend.
- Implemented a shared native Vulkan handle solution to import and display swapchain images within Unity at 80fps.
- Implemented compositor layer masking, enabling simplified visualization and debugging of display layers while eliminating gRPC overhead for layer image transmission.
- Integrated Vulkan validation into the XRSim CI pipeline, catching issues at diff time for a system affecting 100+ developers across 10,000+ sessions.
- Keynote presenter, mentor, and judge at the London XR Hackathon, engaging with 200+ Quest developers.

Software Engineer - Graphics (*June 2020 – July 2024, Remote, Los Angeles CA*)

Core contributor to the Meta Quest Unreal Engine fork, driving rendering quality, display pipeline improvements, and spatial computing feature development with direct impact on the Quest developer ecosystem.

- Led Vulkan Validation Layer (VVL) Quality Lockdown with Qualcomm and Epic, reducing VVL errors in the UE fork by 80% and building an automated detection system to catch regressions at CI time.
- Upstreamed multiple major rendering features to Epic's mainline UE5, landing in UE5.4 (tonemap subpass, HDR multi-view fixes) and UE5.5 (Bloom HDR, stencil buffer multi-view fix) — freeing 33% of time previously spent on merge overhead.
- Implemented Vulkan Tonemap Subpass for UE4 and UE5, enabling performant post-processing on mobile VR devices; demonstrated in [Graphics Showcase](#) and now the default post-processing path for Epic's MobileHDR renderer.
- Added Multiview Per View Viewports and Render Areas Vulkan extensions to UE5 (v59), a critical Quest 3 performance improvement given its increased tile size.
- Added HDR multi-view, stereo rendering support, and deferred rendering multi-view support to the UE5 fork.
- Resolved launch-blocking GPU hangs in Asgard's Wrath 2 (particle system) and Ghostbusters (shader resolve extension), enabling teams to ship on schedule.

- Debugged and fixed a texture stretching bug in Asgard's Wrath 2 that multiple experienced teams had been unable to resolve.
- Shipped [Showdown on Quest](#) (29k installs; covered by Road to VR) and SharedSpaces ([Unreal](#) / [Unity](#), 41 GitHub forks, 78 stars) as open source developer resources demonstrating VR optimization techniques.
- Defined and owned the UE5 Graphics Feature Roadmap, setting cross-team technical direction for Quest graphics development; presented at DevTech Offsite and adopted by cross-functional teams as the shared planning framework.
- Reduced UE sample release time from 2+ days to a few hours by proposing and implementing GitHub Enterprise workflow improvements adopted across the team.
- Served as cross-functional reviewer for GPU performance in System Resource reviews for new OS features.
- Presented at SIGGRAPH LA.

Envisics

**Los Angeles (Remote) /
Milton Keynes, UK**

Jan 2018 - May 2020

Principal Algorithm Engineer

Owner and architect of the holographic real-time engine (RTE) for automotive AR head-up displays — a full-stack display pipeline spanning software rendering, FPGA processing, and optical system integration — produced for US and European auto manufacturers.

- Self-taught low-level digital logic design and FPGA tooling (Quartus, DSP Builder) from scratch, delivering the first working real-time holographic engine in under a year.
- Achieved 8x performance improvement by applying parallel processing architecture.
- Architected FPGA / ASIC designs using high-level synthesis, existing IP, and Verilog / VHDL.
- Implemented HDMI video IO with DDR frame buffers on FPGA for 60fps streaming video.
- Partnered with systems and optics engineers to align engine output with hardware display specifications, bridging software, FPGA, and optical system requirements.

Daqri

Los Angeles, CA

Dec 2012 - Dec 2017

Senior Holographics Software Engineering Manager (Oct 2016 – Dec 2017)

- Optimized hologram rendering algorithms on CPU/GPU: 10x render time reduction, 2x display framerate increase.
- Engineered a display calibration application reducing a 1-hour manual process to under 10 minutes with measurably improved image quality.

- Onboarded to Matlab and Simulink toolchain for signal processing and algorithm prototyping, applying DSP techniques to holographic image quality challenges.

Senior Mobile Engineering Manager *(Dec 2012 – Sep 2016)*

Led engineering team delivering a portfolio of AR applications for Fortune 500 clients including Ford, SpaceX, Lego, Crayola, Anheuser-Busch, and Cadillac.

- Grew team from 4 to 12 engineers with 2 project leads to meet concurrent project demands.
- Delivered a high volume of Unity-based AR apps across iOS and Android, managing App Store and Google Play submissions and updates across dozens of titles.
- Owned and architected Crayola ColorAlive AR app: 2.3 million installs.
- Identified strategic need for ARToolKit technology, leading directly to its acquisition by Daqri.
- Saved \$144k annually by migrating team tooling from Apperian to HockeyApp.
- Architected modular data-driven app framework enabling rapid configuration across diverse client projects.

Music Mastermind Inc.

Calabasas, CA

July 2010 - Dec 2012

Engineering Manager

Built and led a small team of engineers creating an iOS music creation app in C# and Unity 3D.

- Designed and implemented key systems including the UI state machine and XML-based content management.
- Reduced codebase size of the instrument management system by 80% while extending functionality.
- Collaborated closely with art, design, networking, and backend teams to integrate assets, animations, and server-side content into a cohesive player experience.

Activision / Neversoft

Woodland Hills, CA

May 2002 - April 2010

Over 8 years progressed from scripting UI systems and maintaining existing game features to designing and owning core input, physics, and animation architecture across two major AAA franchises.

Gameplay / Animation Programmer - Guitar Hero

Released Guitar Hero World Tour, Guitar Hero Metallica, and Guitar Hero 5 in under 2 years.

- Designed and maintained the drum controller input system across all Guitar Hero titles.
- Developed a real-time data-driven drummer animation system for Guitar Hero World Tour.

Gameplay / Animation Programmer - Tony Hawk's Pro Skater

Released 6 titles over 6 years (Tony Hawk's Pro Skater 4 through Tony Hawk's Proving Ground).

- Co-designed the patented "Nail the Trick" input system.
- Designed and programmed the full BMX gameplay system including collision, controls, and animation.
- Developed complex animation systems blending 100+ simultaneous animations into a single pose.

Skills

AR / VR / XR / MR	C#	Performance Optimization
C++	Python	FPGA (Altera/Intel)
Unreal Engine	Unity	HLS
Vulkan	gRPC	Verilog
OpenXR	Git	Holographics
Spatial Computing	CI/CD	Matlab
Real-Time Graphics	Android	Simulink
RenderDoc	iOS	Object-Oriented Design
Debugging	Xcode	UI / UX

AI Tools: Claude · MyClaw · Codex · Gemini

Talks & Publications

Talks

- "Quest 2: VR Minus the PC" — SIGGRAPH Los Angeles, 2022
- "Unreal Engine Updates: Faster and Less Monolithic" — Meta DRE Offsite, 2025
- Keynote Presenter & Judge — London XR Hackathon, 2024

Podcast

- [Unity SharedSpaces](#) — Developer podcast, 2022 (36k views)

Publications

- ["Showdown on Quest Part 1: How App SpaceWarp Improves Performance"](#) — Meta Developer Blog, 2022
- ["Showdown on Quest Part 2: How We Optimized the PC VR Demo for Meta Quest 2"](#) — Meta Developer Blog, 2022
- ["Graphics Showcase: Using Vulkan Subpasses in UE4 for Performant Tone Mapping on Quest"](#) — Meta Developer Blog, 2022
- ["Oculus Multiplayer Development Quick Start Guide"](#) — Meta Developer Blog, 2022

Patents

- ["Nail the Trick" Input System](#) — U.S. Patent US20080102962, Activision / Neversoft, 2008

Education

BS Computer Science

Weber State University

May 2001

Interests

Outdoors: Mountain Biking, Cycling, Rock Climbing, Snowboarding, Skateboarding
Tech: SIGGRAPH Member, Electronic Frontier Foundation (EFF) Member