

Marco Gomez

Principal Software Engineer - Real-Time Graphics & High-Performance Web

United Kingdom · Remote

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TheCodeTherapy

Principal Software Engineer with 31 years of production experience, focused on pushing web applications beyond what most people believe a browser can do: real-time rendering on WebGPU and WebGL, deterministic multi-user simulations, GPU-accelerated tools, and the complete products around them. Led browser-3D engineering at Improbable, the company behind 10,000-player virtual worlds. Featured by Google at Google Experiments. 6 international design awards.

EXPERIENCE

- Tech Lead & 3D Engineer @ Improbable**

Apr 2023 - Present

 - Core developer of MML, an open-source markup and programming language whose documents are networked from the ground up, so creators build multiplayer interactive experiences with no user-facing netcode.
 - Created and led development of 3D-Web-Experience, an open-source game engine for multiplayer 3D worlds in the browser, adopted as the reference implementation for MML-based experiences.
 - Performed the first-ever live development of a 3D multiplayer game from inside the running game, with players present as changes landed in real-time. The session recording has 17,000+ views on X.
- Tech Lead & Senior WebGL Engineer @ ROOM 3D Communications**

Apr 2021 - Apr 2023

 - Recruited personally by Cevat Yerli, founder and former CEO of Crytek, to lead browser-3D engineering of an immersive 3D communications platform.
 - Led 3D-engine engineers, artists and designers building real-time avatar-based meetings in the browser: WebGL rendering, WebRTC media, and TensorFlow-based ML features.
- Tech Lead & Head of Innovation @ SignStix**

Sep 2020 - Apr 2021

 - Directed development of the full digital-signage platform: cloud back end, front-end authoring tools, and firmware-level work on single-board computers, IoT devices, and system-on-chip screens.
- Lead WebGL Developer @ Clevertech**

Apr 2020 - Sep 2020

 - Designed and built the company's first internal WebGL framework, enabling React developers with no graphics or linear-algebra background to ship production 3D applications.
- Senior Software Engineer & AWS Architect @ Hermes UK**

Jun 2019 - Apr 2020

 - Lead developer of the AI-driven IVR for the UK's second-largest parcel carrier - voice synthesis and speech recognition over Node.js, Amazon Lex, Lambda, and Connect - handling ~20,000 calls a day and resolving ~80% without human escalation.
- Software Engineer & Consultant @ MgzMe (own consultancy)**

2014 - 2019

 - Delivered custom software, systems architecture, and Linux infrastructure for UK clients as an independent consultant.
- Community & Programming Manager @ Machinima, Los Angeles**

2012 - 2014

 - Led a Sony PlayStation campaign coordinating 3 in-house teams and 60+ content creators; campaign channels gained 300,000+ followers in under 3 months.
- Game development, systems administration, automation, financial-market systems @ Earlier career**

1995 - 2012

 - Across Brazil and the US (details upon request).

SELECTED PROJECTS

- mgz.dev**

TypeScript, Next.js, WebGPU, Node.js, Postgres, Docker

A complete Games & Apps platform owned down to the bottom of the stack: it ships self-published games on a custom deterministic game engine, runs authoritative multiplayer servers for its online titles, and stands on auth, UI system, database layer, and zero-downtime deploy infrastructure all built by myself. Every game and app is an independently built artifact composed seamlessly into the platform, developed with its own in-house tooling.

[the games](#)

[the tech](#)
- Epoch Engine**

TypeScript, WebGPU

The game engine behind many of my published games: bit-perfect cross-platform deterministic simulations, input-tape replay and rewind, and server-authoritative rollback multiplayer with a byte-for-byte convergence tests in CI. Everything a shipped game needs is built in: a custom lighting system that scales to hundreds of shadow-casting lights through one tiled shadow atlas, layered GPU post-processing, CDLOD procedural terrain with FFT ocean water and sky, navmesh generation, procedural and spatialized audio synthesis, text and vector rendering, touch controls, and live in-game debug tooling.
- Epoch Renderer**

Rust, wgpu, WGSL

Rust/wgpu renderer: clustered-forward real-time PBR renderer with zero per-frame allocation enforced in CI. Native and WebGPU-in-browser from one codebase.
- Basisu**

Rust

Pure-Rust, zero-FFI Basis Universal transcoder [ETC1S, UASTC and UASTC-HDR to BC1-7, ASTC and PVRTC], proven byte-exact against the reference C++ across thousands of textures.
- MeshOptimizer**

Rust

Pure-Rust port of meshoptimizer with all 20 modules bit-exact against the C++ oracle, proven through IEEE-754 bit comparisons.
- The Code Therapy**

TypeScript, Node.js, React, WebGL, GLSL

Full-stack in-browser GLSL shader IDE: live coding, real-time preview, authentication, and texture, audio and video inputs.

[thecodetherapy.com](#)
- Plexus-Shaders**

Three.js, WebGL, GLSL

WebGL/GLSL audio-reactive experience featured by Google on Experiments with Google.

SKILLS

- Languages:** TypeScript/JavaScript · Rust · C · C++ · C# · GLSL · WGSL · Python · Lua · Go · Odin
- Graphics & GPU:** WebGPU · WebGL · OpenGL · Three.js/TSL · PBR & IBL · clustered lighting · shadows [CSM/PCF] · post-processing [SSGI/GTAO/OIT/bloom/tonemapping] · texture compression [KTX2/Basis] · mesh optimisation · BVH · shader tooling
- Web platform:** React · Next.js · Node.js · WebAssembly · WebXR · WebRTC · Web Audio · WebSockets · Electron/Tauri/React Native
- Engines & simulation:** Deterministic cross-platform simulations · rollback/replication netcode · ECS design · fixed-point maths · Bevy · Unreal · Unity · Godot
- Audio DSP:** STFT/spectral processing · synthesis [FM/wavetable/PSG/SID] · PipeWire · real-time-safe design
- Infrastructure:** Linux [25+ years] · Docker · AWS [Lambda/Connect/Lex/EC2/S3/CloudFront] · GCP · CI/CD [GitHub Actions, Jenkins]
- Correctness engineering:** Differential/oracle testing · golden-image CI · allocation-tracking gates · cross-platform determinism verification · fuzzing · custom lints

RECOGNITION

- Featured by Google - Experiments with Google [Plexus-Shaders]
- 6 international design awards - Awwwards [Honors, Mobile Excellence] · CSS Design Awards [Innovation, UX, UI, Special Kudos]
- 410K+ technical audience - YouTube 310K+ · X 100K+ [[@TheCodeTherapy](#)]

EDUCATION & LANGUAGES

Information Technology - Universidade Paulistana, São Paulo
English [fluent] · Portuguese [native]