

ROB MARAN

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LIVE ARCHITECTURE & IP

<https://robmaran.com>

Live demonstration of my proprietary 14-module web architecture and air-gapped tensor systems.

PROFESSIONAL SUMMARY

Lead Systems Engineer and Architect specializing in low-level runtime engines, machine learning optimization, and high-performance WebGL graphics architecture. Proven expertise in replacing high-overhead frameworks with zero-dependency C++, WebAssembly (WASM), and Vanilla JavaScript pipelines. Architect of air-gapped tensor systems, secure cross-platform alpha video Digital Rights Management (DRM), and Counter-Reverse Engineering (CRE) AppSec, delivering **0 ms Total Blocking Time (TBT)** within **sub-1MB full-stack payloads**. Demonstrates a rare hybrid of deep technical architecture, UX design, corporate financial compliance, and E-E-A-T SEO distribution, having engineered Awwwards-submitted platforms and reverse-engineered recommendation engines to scale an independent media channel to **140,000+ followers** and **10+ million organic views** over 4 years with zero marketing spend.

WORK HISTORY

Independent Consultant & Systems Architect

Self-Employed | January 2026 – Present

- Architected and deployed a proprietary 14-module enterprise web architecture (sub-1MB payload) on robmaran.com. Developed independently on personal time and hardware, entirely outside the scope of my concurrent ADENTRA engagement.
- **Architecture & Patents:** Authored provisional patent roadmaps for bare-metal systems, unmanaged tensor pipelines, and CRE security architectures.
- **Colorimetry & Memory:** Engineered a 64-bit Delta E processing pipeline (HYDRA) compiling C++ to WebAssembly. Processed 10,000+ concurrent CDN links sustaining 35+ GFLOPS, preventing browser crashes during 50,000+ asset ingestions using algorithmic Garbage Collection (GC) bifurcation and OffscreenCanvas worker offloading.
- **Air-Gapped Tensor Systems:** Eliminated WASM serialization bottlenecks via pure Vanilla JS Float32/64Array zero-copy pipelines, achieving 99.97% Kaggle classification accuracy. Engineered payload-agnostic biomedical edge inference pipelines for secure, localized genomic mapping (HexDNA Splice Junction Prediction, T2T-CHM13), seamlessly scaling architectures across defense and civil environments.
- **Distributed Compute:** Sustained 4.5+ TFLOPs by distributing loads across decentralized P2P Web Worker meshes bound to CPU topology limits. Demonstrated linear hardware scaling across mobile processors and GPU clusters, secured natively via BroadcastChannel API and Atomics.
- **Security & DRM:** Architected secure cross-platform alpha video DRM (Banshee Matrix) and Counter-Reverse Engineering (CRE) defenses. Deployed a dual-tensor spatial watermarking system achieving a >2-sigma detection rate and <3-sigma false positive rate.

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- **Active Defense Mechanisms:** Integrated AV cipher/decipher steganography (<16kHz Morse code spread spectrum), WebCrypto API AES-256-GCM, Asymmetric Decoy Routing, and OS-level tick workers for autonomous key zeroization upon debugger detection. Incorporated Dynamic Cryptographic Dusting, Matryoshka Encryption, and Silicon Fingerprinting across the FFI boundary, fortified by AST Obfuscation and Terser.
 - **WebGL & Desktop SaaS:** Pioneered an NPOT 16K WebGL PBR rendering architecture and an interactive Claude AI chatbot synchronized via Web Audio API (Biquad Filters, OscillatorNode). Managed scroll and layout performance via custom fluid kinetics (Butterflux), ImageBitmap decoding, and IntersectionObserver culling. Engineered enterprise-grade Desktop SaaS apps using Electron/Node.js with Privileged TCP Muxing Protocols, Inter-Process Communication (IPC), and Micro-Staggered Dead Letter Queues (DLQ).
 - **Growth & Distribution:** Scaled an independent media property to 140,000+ followers and 10+ MM views by reverse-engineering algorithmic E-E-A-T signals. Achieved an unprecedented 33% engagement-to-follower conversion rate (1 follow per 3.04 likes), proving elite capability in systemic content distribution. Built the core delivery infrastructure using Service Workers, CacheStorage API (PWA), Cloudflare KV, and Reverse Proxy routing. Directed an automated CI/CD edge deployment pipeline powered by esbuild, Binaryen (wasm-opt), and Wrangler (with UI styling via Tailwind CSS).

Lead Full-Stack Systems Architect (Consultant)

ADENTRA Inc. | November 2021 – May 2026

- Served as technical architect for diverse enterprise Content Management Systems (CMS), managing global server infrastructure, aggressive Content Delivery Network (CDN) caching, and Secure Sockets Layer (SSL) security across 20+ premium B2B platforms.
- Architected an isolated, non-trackable delivery node to globally inject GDPR-compliant Consent Management Platforms (CMP) and master map routing via decoupled iframes. This microservice established a Single Source of Truth (SSOT), inherently neutralizing HTTP Strict Transport Security (HSTS) cross-domain friction and telemetry pollution without fragile cross-origin workarounds, fortified by Sucuri Web Application Firewalls (WAF).
- Engineered Cloudinary Digital Asset Management (DAM) integrations via REST API pipelines and pioneered generative AI media production for internal communications and custom SharePoint templates.
- Spearheaded Power BI Data Lake implementations and enterprise data architecture, providing executive paralegal support for the preparation and filing of corporate earnings reports via the Q4 Inc. Investor Relations platform.

EARLY CAREER

Senior Software Engineer & Mobile Developer

Independent & Consulting Initiatives | January 2015 – December 2020

- Architected and scaled full-stack software, networking, and distributed systems, transitioning monolithic architectures into high-availability environments and optimizing continuous enterprise deployments.

Software Engineer & Mobile Developer

Independent & Consulting Initiatives | January 2009 – December 2014

- Pioneered early mobile technology (2009 iPhone App Store / 2010 iPad native apps), leading foundational full-stack web and mobile application development across diverse digital strategy initiatives.

EDUCATION & CERTIFICATIONS

- **BA in Economics (Core: Statistics & Calculus)** | York University
- **Canadian Securities Course (CSC)** | CSI
- **AI-Powered Google Ads Certification** | Coursiv

SKILLS

- **Languages & Core Stack:** C/C++, JavaScript (Vanilla/ES6+), Node.js, Python, Rust, WebAssembly (WASM), OpenGL Shading Language (GLSL), HTML5, CSS3, DOM Physics, V8 Engine Monomorphic Optimization, requestAnimationFrame, Linear Interpolation (LERP), Mutation Observers, SVG Sprite Mapping, IntersectionObserver, ImageBitmap, Canvas 2D API, ES6 Metaprogramming (Proxies/Reflect).
 - **Graphics, Media & Cloud:** Raw WebGL 2.0, WebGPU Compute, Hardware Acceleration, Physically Based Rendering (PBR), Canvas Multiplexing, NPOT 16K Textures, O(1) Constant-Time Raycasting, OffscreenCanvas, Electron, LibRaw, stb_image, HEVC/WebM MediaSource Extensions, Web Audio API (Biquad Filters, OscillatorNode), Cloudflare (Workers/Turnstile WAF/KV), Serverless/Edge Computing, Reverse Proxy, Air-Gapped Runtimes, Progressive Web Apps (PWA).
 - **Data, Infrastructure & IT:** Distributed Systems, High Availability Architecture, SharedArrayBuffer, Web Workers (P2P MessageChannel Mesh), Atomics, BroadcastChannel API, Inter-Process Communication (IPC), CPU Topology Inference, Float32/Float64Array, Zero-Copy Memory Transfers, Endian-Agnostic Hydration, Algorithmic Garbage Collection (GC) Bifurcation, React/Next.js, Digital Asset Management (DAM), REST APIs, WordPress, WooCommerce, SharePoint, Power BI.
 - **Machine Learning & Math:** PyTorch, Deep Neural Networks, 1D Dilated Convolutional Neural Networks (CNNs), Genomic Sequence Processing, Predictive AdamW Telemetry, Fast Fourier Transform (FFT), Error Level Analysis (ELA), K-Means Clustering, LLVM/Clang Single Instruction, Multiple Data (SIMD) Vectorization, Claude API Custom Personas, BigInt Arbitrary-Precision Math, CIEDE2000 (Delta E), Oklab/OkIch Perceptual Colorimetry.
 - **Security & Tooling:** AES-256-GCM, PBKDF2, WebCrypto API (SubtleCrypto), Counter-Reverse Engineering (CRE), AST Obfuscation, Terser, AV Cipher Steganography, Asymmetric Decoy Routing, TrustedTypes Content Security Policy (CSP), Subresource Integrity (SRI), Prototype Pollution Prevention, CI/CD, Git Version Control, esbuild, Binaryen (wasm-opt), Tailwind CSS, Wrangler, Brotli Compilation, Cross-Origin Opener Policy (COOP), Service Workers, CacheStorage API.
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