

JUSTIN FISCHER

Product Engineer · 3D, Real-Time & AI

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SUMMARY

Product engineer who ships end to end, with twenty years of production 3D underneath. Recently built and deployed a full-stack browser 3D platform solo (TypeScript, React Three Fiber, Next.js, Supabase, Stripe, GPU inference) and a native iOS application in Swift and Metal. Before that, five years leading technical systems for Meta's avatar platform, including AI agents that automated production art workflows, across teams of up to 35. Feature film and Emmy-winning VR before that. Fluent with artists, engineers, and product, and able to build the thing.

SELECTED PROJECTS

Atomic Rig · atomicrig.com

2026 · solo, deployed

Browser-based modular 3D avatar platform. Assemble characters on a humanoid skeleton, export production-ready GLB/FBX.

- Built and shipped the entire product solo (front end, backend, auth, payments, infrastructure) across 500+ commits in five months.
- **Stack:** Next.js 16, React 19, TypeScript, Three.js / React Three Fiber, Zustand, Supabase (Postgres, Storage, RLS), Clerk, Stripe, Modal (GPU inference), Upstash Redis, Sentry, Vercel.
- Wrote a binary FBX 7.4 exporter from scratch, covering matrix layout, Euler order, unit scale, and BindPose vs. local hierarchy, because no browser-side option produced engine-valid output.
- Architected an event-driven transform system to hold frame rate in a 3D editor, bypassing React's reconciler for high-frequency drag updates; documented as ADRs alongside undo/redo, state, and export decisions.
- Shipped a PBR material editor, an animation system with Mixamo FBX loading, and an image-to-3D pipeline on GPU inference with Stripe-metered credits.
- Integrated **3D Gaussian splat environments** into the real-time scene: a cached multi-format loader (PLY, SPLAT, KSPLAT, SPZ) with per-splat recolor, opacity, and transform control.
- Production-hardened: authenticated API routes, row-level security, rate limiting, secret management, Vitest and Playwright coverage.

Stealth Startup: iOS Gaussian splatting renderer & compression pipeline

2026

Real-time 3D Gaussian splat rendering on iOS, where no existing library could run.

- **Built a 3DGS renderer from scratch for React Native.** Every existing library (Spark, GaussianSplats3D, PlayCanvas gsplat) hard-requires *Worker* and *WebAssembly*, neither of which the Hermes JS engine implements, so the decoder, depth sort, and material were written ground-up.
- Wrote a .spz decoder, moved per-splat dequantization from JS into the shader, replaced a comparator sort with a counting sort, and shifted ZSTD decompression to an offline prep step, taking cold load from ~5s to under 1s at 589K splats.
- Ported the material to **three.js TSL on WebGPU** (react-native-webgpu / Dawn) with true anisotropic splatting: per-splat 3D covariance built from scale and rotation, projected to a screen-space ellipse driving both billboard sizing and fragment falloff.
- **Designed the compression pipeline:** WebP-packed quantized attributes (16-bit log-domain positions, smallest-three quaternions, codebook scales and SH0) plus splat decimation: **70MB captures down to ~2.5MB, and 1.5M splats to ~500K.**
- Built the surrounding product: Expo/React Native client, FastAPI backend on AWS App Runner, S3 asset streaming with on-device LRU caching, DynamoDB, and custom native modules.

ShadowBox

2026 · solo, in development

Native iOS physics puzzle game. The phone renders as a glass shadowbox with real depth.

- Swift and Metal: off-axis frustum projection driven by CoreMotion at 120Hz, locking perspective to physical device orientation.
- Single-pass frosted-acrylic shaders (Fresnel rim, background mipmap sampling, chromatic dispersion) tuned for tile-based mobile GPUs.
- Procedural volume-preserving mesh deformation, Core Haptics coupling, and velocity-mapped dynamic audio.

TECHNICAL SKILLS

Product & Web	TypeScript, React, Next.js, React Native/Expo, Node, Zustand, Postgres/Supabase, AWS (S3, DynamoDB, App Runner), Stripe, Clerk, Vercel, FastAPI, REST API design, Vitest, Playwright
3D & Graphics	Three.js, React Three Fiber, WebGL, WebGPU/TSL, Metal, GLSL, 3D Gaussian splatting (3DGS): renderers, compression, quantization , GLB/GLTF, FBX, PLY/SPZ/SOG, USD, real-time rendering, shader development, skeletal animation, deformation systems, computational geometry
Languages	TypeScript/JavaScript, Python (15+ yrs), C++, Swift
AI	LLM API integration, AI agent development, GPU inference (Modal), AI-assisted development workflows
Platforms	Unity, Unreal, Maya, Git, Perforce, Linux, iOS (CoreMotion, Core Haptics, StoreKit)

EXPERIENCE

Meta, Reality Labs (Avatars)

Remote · Jan 2021 – Mar 2026

Tech Lead, Technical Art (Feb 2022 – Mar 2026) · Technical Artist (Jan 2021 – Feb 2022)

- Led multiple interdependent technical workstreams through the Style 2.0 platform launch, coordinating cross-functional teams of up to 35 engineers and artists.
- Built Python workflow automation and **AI agents integrating LLM APIs** to eliminate repetitive production work, an early production deployment of agentic tooling inside a real art pipeline.
- Designed and shipped an **automated clothing-fit system** using procedural deformation, resolving millions of garment-and-body combinations under quality and performance constraints.
- Architected dependency-graph systems for complex asset relationships and procedural generation at platform scale.
- Designed real-time character customization supporting user-generated content, optimized for mobile rendering budgets.
- Authored API specifications and pipeline documentation; established technical standards and execution patterns across teams.

Baobab Studios

Remote · Oct 2016 – Jan 2021

Rigging Lead to Asset Supervisor. Asteroids!, Crow: The Legend, Bonfire, Baba Yaga

- Delivered film-quality character deformation inside a 90fps VR performance budget.
- Built Python pipeline tooling integrated with Unity, automating asset export and validation.
- Optimized skeletal animation for VR with LOD strategy and GPU skinning to hold frame-rate targets.

Laika

Hillsboro, OR · May 2014 – Oct 2016

Rigging Technical Director. Kubo and the Two Strings (Academy Award nominee), Missing Link

- Built the studio's cloth simulation pipeline in Maya with Python tooling for distributed server-side jobs.
- Developed the facial system for 3D-printed faces, generating precise deformation data driving a physical manufacturing pipeline.

DreamWorks Animation (PDI)

Redwood City, CA · Mar 2008 – May 2014

Character Technical Director. Shrek Forever After, Rise of the Guardians, Madagascar 3, Mr. Peabody and Sherman

- Lead Pipeline TD on *Mr. Peabody and Sherman*, establishing character workflows and technical standards.
- Built crowd character systems for *Madagascar 3* achieving hero-quality deformation at scale on the render farm.
- Developed hair and feather simulation systems and procedural grooming tools for *Rise of the Guardians*.

Laika

Hillsboro, OR · Sep 2006 – Feb 2008

Rigging Technical Director

- Established the character pipeline and Python infrastructure for a hybrid stop-motion/CG production workflow.

AWARDS & RECOGNITION

- **2× Daytime Emmy Award winner**, Outstanding Interactive Media (Television Academy)
- **2× Annie Award winner**, Best Virtual Reality Production (ASIFA-Hollywood)
- **Academy Award nomination**, *Kubo and the Two Strings* (2016), contributing Technical Director
- **SIGGRAPH 2019**, first-ever Best in Show, Immersive Pavilion
- **SIGGRAPH 2012**, published technical paper: *Improving Crowd Quality Through Interdepartmental Collaboration on Madagascar 3*

EDUCATION

BA, Animation, The Art Institute of Portland