

Curtis Todd

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QUALIFICATIONS SUMMARY

Senior engineer and technical architect with 18 years across game development, machine learning, pipeline automation, team leadership, and stakeholder management. Designed, built, and authored the 79-claim patent for a system combining computer vision ML with deterministic geometry generation for game engine assets. Career-wide pattern of integrating complex technical systems into working solutions, from research prototypes to finished products.

PROFESSIONAL AND TECHNICAL SKILLS

- Hybrid ML & Distributed Systems
- Computer Vision & Deep Learning (PyTorch)
- Production ML Serving & MLOps
- Rule-Based & Production-Rule Systems
- C++, Python, C# Development
- Real-Time Engines & Physics (Unreal)
- GPU & HPC Performance Optimization
- Distributed Services & API Architecture
- Procedural Asset Generation (Houdini)
- 3D Math and Computational Geometry
- Cloud-Native Development (Docker, CI/CD)
- Technical Leadership & Mentorship

WORK EXPERIENCE

Procedural & ML Pipeline Architect

Nov 2025 - Present

Dream Book LLC, Remote

- Authored a 79-claim provisional patent for a pipeline combining machine-learning inference with deterministic procedural modeling to produce game-ready 3D models from 2D architectural plans.
- Owned the orchestration architecture for the pipeline across a FastAPI control plane with 80+ endpoints, a Celery DAG executor running 30+ stages, and a Postgres/Redis/S3 data plane.
- Optimized the pipeline through inference batching, model size reductions, and graceful degradation, cutting processing from 5 minutes to 30 seconds and raising success rate from 10% to 95%.
- Architected a non-learning, deterministic pipeline that processes DCC agnostic architectural CAD models into game ready assets using Python for orchestration and rule-based geometric semantic classification, C# for file type conversions and data extraction, C++ for custom, high-speed Houdini import/export nodes, and Houdini itself for further geometric processing.
- Engineered ML training and inference services including queue based jobs, boot-time GPU prewarming, per job inference and training configurations, and best/latest checkpoint resolution spanning YOLO, SAM2, U-Net, and PaddleOCR in PyTorch.
- Drove ML model quality by building a validation feedback loop and tag-based failure analysis that surfaced underrepresented training set categories, enabling targeted data acquisition to close the gaps, plus real time training run feedback to accelerate iterations.
- Implemented an in place override system letting admins correct model outputs to deliver final assets faster, automatically feeding those corrections back as training data to close the active learning loop.
- Shipped the admin platform for creating new ML projects with 15 model options, training image upload, multi-user annotation, and training-run configuration and monitoring.
- Developed a pipeline run viewer letting admins track client file processing stage-by-stage, in real time or historically, with debugging tools and performance metrics.

Senior Game Developer

Aug 2022 - Nov 2025

Maverick Media Designs LLC, Remote

- Architected a hierarchical game AI system for Unreal using RL motor control policy with reward shaped training scenarios and a higher level strategic director coordinating a three-agent alliance.
- Prototyped and tested ML inference inside Unreal, integrating learned behavior with the engine's pathfinding and decision tree systems.
- Engineered a physics-driven multiplayer solution with multithreaded client reconciliation, rewinding and resimulating the local physics sim within a 16.6ms frame budget while remaining server-authoritative.
- Built an Unreal Engine dedicated server that consumed less than 2ms of each server tick, leaving headroom to host multiple matches per core, and allowing cross-platform play between Windows and Apple Silicon clients.
- Integrated Bullet Physics into Unreal Engine to provide gameplay with deterministic physics and complete simulation control.
- Designed procedural tools for robotic assets in Houdini to accelerate artist-driven content creation, improve iteration speed, and maintain consistency across assets.
- Assembled modular animation systems from skeletal targets, dynamic material instances, Vertex Animation Textures (VAT), and IK/FK control rigs for mechanical assets.
- Held an 8.3ms frame budget on a 2070 Super PC and 16.6ms on M1 Max, profiling CPU, GPU, memory, and VRAM, then trimming meshes, LODs, Nanite/Lumen, and material complexity, packing the CPU timeline across 3 cores to leave headroom for future gameplay systems.

Engineering Manager

Jan 2014 - Jul 2022

ShareSafe Solutions LLC, Remote

- Led R&D efforts across potential product lines, development technologies, and team productivity enhancements, bridging business and engineering to pressure-test stakeholder ideas, secure buy-in, and deliver everything from shipped features to internal tooling and validated prototypes.
- Diagnosed inefficiencies and process gaps and led over 50 technological, procedural, and cultural transitions to address them.
- Unified separate iOS and Android apps into a single Xamarin app, replaced a monolithic PHP/MySQL site with .NET microservices, and migrated 20,000 user accounts across 9 clients from legacy self-hosted auth to OAuth 2.0.
- Translated constraints between engineering, product, and design teams into roadmaps balancing feature delivery with technical debt reduction.
- Established CI/CD, Agile, and TDD to maximize team velocity, process efficiency, and system reliability.
- Migrated cloud architecture and managed Azure infrastructure, including HIPAA-compliant data and cost optimization.
- Mentored international teams of engineers, QA testers, and designers to consistently deliver high quality software updates and provide post-launch support for tens of thousands of users.

EDUCATION and PATENTS

Southern Wesleyan University, Central, SC

- Bachelor of Science in Computer Science
- Bachelor of Science in Management of Information Technology

Provisional Patent

- *Building Layout Extraction Pipeline with Rigid-Anchors and Notated Topology*
Dreambook, 2026