Persona

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21 June 1993

https://lowentry.com/

Languages

English ●●●●●
Dutch ●●●●●

Skills

Game Dev (UE5, C++, Blueprint) ●●●●●

Pipeline & Tools (C++, Python, Nodejs) ●●●●●

Fullstack Web Dev (JS/TS, React, Nodejs) ●●●●●

Project Management and Leadership ●●●●○

DevOps (Docker, Kubernetes, Serverless, Terraform) ●●●●○

Patrick Vane

Principal Software Engineer

Principal Software Engineer with 15 years in game development, web applications, and 3D graphics. Contributed to Unreal Engine core at Epic Games. Builds complete production systems from zero and creates technical foundations that teams scale on. Expertise in Unreal Engine C++, blueprint, full-stack TypeScript/React/Node, Three.js, Python scripts, and distributed systems.

Highlights

- **Unreal Engine Core Contributor**: Developed the Render Grid plugin (shipping since UE 5.1), headless Movie Render Queue, and Python multi-frame execution.
- **First Engineer and CTO**: Built complete technical infrastructure from zero, scaled to over $1M revenue.
- **Invented Layered Render Technique**: Reduced panorama render count from thousands to dozens by compositing style variations at runtime.
- **Achieved Unreal Quality Web Graphics**: Three.js rendering pipeline matching Unreal Engine visual quality, also supporting mobile browsers.
- **Created Unified Socket Server**: Java library supporting TCP, UDP and WebSocket on a single port, a capability not found in any other public library.
- **Published Unreal Engine Plugins**: 300K+ downloads and 4.9 star rating over 10 years.
- **Developed AI Assisted Workflow**: Automated system where AI learns from its mistakes. After a training period, it reduces manual code intervention to near zero.

Work experience

Principal Software Engineer
Spatial Support | Jul 2025 - Jan 2026

- Built a custom Three.js rendering pipeline achieving Unreal Engine visual quality: implemented TAA with motion vectors, neighborhood clamping, and velocity-based blending to eliminate ghosting and smearing on transparent/transmissive materials. Also implemented bloom, sharpening, and AO integration.
- Implement automatic quality adjustment based on measured frame times, making it function well on all devices (old, new, fast, slow).
- Built an in-browser instant model pipeline: format conversion to GLB, zip/rar extraction, Draco mesh compression (required non-trivial modifications to get the encoder running client-side), mesh cleanup (invalid names, duplicate detection), and live preview - all executing immediately on file selection, within the browser, with zero waiting.
- Engineered a WebSocket-based tour streaming system with robust recovery logic for missing and out-of-order chunks, reconnection handling, and audio-to-text synchronization for AI-guided 3D walkthroughs.
- Designed multi-LLM integration layer (OpenAI, Anthropic) with spatial context injection, translating 3D camera state and geometry selection into AI-understandable prompts.
- Built a studio companion app for content creators: scene configuration, tour authoring, and the instant model upload workflow (described earlier).
- Implemented a system/protocol that gives the AI long-term memory and the ability to learn from its mistakes, enabling it to self-correct in ~98% of cases, nearly eliminating the need for human debugging and coding. Development time shifted almost entirely to an upfront task-definition phase (“pre-work”).

Principal Software Engineer (Lead)

MCM | Aug 2023 - Jun 2025

- Technical owner for the entire tech stack of the project: defined architecture, tooling standards, and all tech trade-offs across Unreal Engine 5, WebGL/Three.js, Python/Docker, and hosting providers.
- Provided day-to-day leadership: coached 3D artists on real-time constraints, handled pipeline support tickets, and served as the single point of contact for all engineering decisions.
- Designed and implemented a panorama rendering plugin for UE5 (C++/Blueprint) end-to-end:
    - Built a configuration UI that lets artists set capture points, exposure sets, and style presets in one pass.
    - Added automated metadata tagging so each render is traceable through the pipeline.
- Invented a layered-render technique that converts rendering time from exponential to additive complexity, allowing unlimited style/location combinations (which were otherwise limited severely).
- Built a panorama web viewer end-to-end:
    - From a prototype in raw WebGL, to a production-quality rewrite using Three.js to gain cross-platform Basis-Universal GPU texture compression, correct alpha blending, and streamlined shader maintenance.
    - Implemented an adaptive streaming loader that pre-caches the next view and keeps first-frame latency at an absolute minimum.
- Architected a serverless delivery model:
    - Dockerized Python/Bash pipeline compresses panoramas (GPU texture compression using Basis Universal), generates multi-resolution mipmaps, and auto-publishes to AWS.
    - Designed and implemented a metadata storage solution that eliminated the need for a database or traditional backend, cutting both ops overhead and recurring costs while increasing maintainability.
- Built a desktop + VR walkthrough app (UE5) end-to-end for the sales team, that lets clients swap layouts, materials, and homestyles in real time.
    - Implemented an automatic, constraint-aware VR teleport system that derives safe landing zones from UE5 collision data, this prevents users from teleporting onto furniture or other invalid surfaces, fully automatically, with no manual work required from the artists.
    - Implemented dynamic performance scaling solutions that maintain high visual quality while achieving sub-8ms frame times on PC-tethered Meta Quest 3 headsets.
- Created a suite of UE5 artist tools and validation scripts to auto-fix or flag asset issues, accelerating art ingest and reducing uncaught errors.

Senior Software Engineer

Epic Games | Jan 2023 - Jun 2023

- Developed the Render Grid plugin end-to-end (Unreal Engine C++), revolutionizing rendering processes for the news, sports, entertainment, and film industries, significantly improving operational efficiencies.
- Actively collaborated with the core Unreal Engine team, contributing to strategic engine improvements and innovations.

Senior Software Engineer (Lead)

StageGlass | Sep 2021 - Jan 2023

- Engineered innovative systems including a streaming platform for Unreal Engine applications (React frontend, Nodejs AWS Lambda and AWS DynamoDB serverless backend), and gameplay functionality (Unreal Engine C++) for architectural visualization apps.
- Led the design and implementation of an interior design tool (React, Unreal Engine C++), managing a team of developers and designers to consistently meet or exceed project goals within tight deadlines.
- Implemented a serverless RESTful API (Nodejs AWS Lambda, AWS DynamoDB) to integrate with third-party services (such as multiple pixel streaming providers), handling high ingestion rates and optimized request processing times, ensuring robust performance and scalability. Used Swagger for API design, documentation, and testing.
- High-ingest logging/analytics pipeline (AWS) for operational monitoring and analytics; tuned for peak load.
- Implemented multiple asset automation tools (Python, Bash) for efficient ingestion and processing of large-scale digital assets, significantly reducing manual intervention and improving workflow efficiency.
- Utilized UML for software architecture design and BPMN for business process modeling and discussion, ensuring clear communication and robust system design.
- Developed a UDP-based data synchronization protocol to synchronize data between the frontend and the Unreal application on the server.
- Setup and owned the containerized Unreal/pixelstreaming workloads (Docker) that operated on Kubernetes, managed rollout strategies and rollbacks.
- Set up continuous deployment using GitHub Actions, including an automatic testing phase, with each branch having its own staging environment automatically configured using Terraform.

Software Engineer (CTO)
Moicon | Feb 2017 - Sep 2021

- Developed advanced web applications (React, Nodejs, PostgreSQL, Bash scripts) for industrial and municipal services, including things such as task management systems, sensor data visualization, and real-time location tracking.
- Real-time WebSocket distribution at scale (high ingest, fan-out, backpressure); horizontally scaled and monitored.
- Designed and implemented scalable cloud infrastructure on AWS to automate backend scaling, enhancing performance and reliability.
- PostgreSQL horizontally scaled using read replicas; writes on the primary, reads on replicas.
- High-ingest sensor data pipeline (Node-RED to Nodejs) with backpressure, batching, and rate limiting; handled peak load reliably.
- Real-time sensor ingest & visualization with buffering/retries and monitoring/alerting for spikes.
- Implemented Linux-based features, including a synchronization system using shared memory (shm).
- Engineered software for internal use that significantly boosted development efficiency, dramatically reducing time-to-market and enhancing product adaptability.
- Grew the company from two (me and the founder) to over ten employees, reaching over a million in annual revenue, and managed the software development lifecycle across all projects.
- Oversaw and directed the entire software development lifecycle at Moicon, handling everything from strategic planning and team management to quality assurance and deployment.

Software Engineer (Lead)
Project Gateway VR Studios GmbH | May 2016 - Dec 2016

- Created an Unreal Engine 4 plugin (C++) and backend system (Nodejs, PostgreSQL) for displaying in-game 3D advertisements called "Vreo," which generated revenue for game developers based on viewing statistics.

Founder & Software Engineer (Lead)
Low Entry | Jan 2015 - May 2016

- Founded the company, created proprietary Unreal Engine plugins (C++), and worked on various freelance projects (PHP, Java, C++, Javascript, etc).
- My Unreal Engine plugins, which include compression and encryption algorithms as well as user-friendly networking functionality, can be found here: https://www.fab.com/sellers/Low%20Entry
- My fully-fledged, easy-to-use socket server library is available here: https://public.lowentry.com/files/LowEntryUE4/java/index.html - it automatically supports both regular TCP/UDP clients as well as WebSocket clients, by identifying HTTP request headers to recognize the client type, and by then handling the packets sent and received accordingly.

Software Engineer (Internship and graduation project)
ConnectSB | Mar 2014 - Nov 2014

- Enhanced client engagement through revitalizing and improving social media management tools for platforms like Facebook, Instagram, and Twitter.
- The project used Symfony as a full stack (with Twig to generate the HTML).

Student (Minor in Sensor Technology)
University of Applied Sciences Leiden | Oct 2013 - Feb 2014

- Developed custom microcontroller circuits and low-level network code (C++, Arduino code) for transmitting data between buildings utilizing lasers.

Software Engineer (Internship)
Studio Projectie | Mar 2013 - Sep 2013

- Developed an UnrealScript editor (Java, Eclipse plugin) with advanced features like autocompletion and error detection, improving development efficiency.
- Developed a Java application for time tracking of employees and clients.
- Developed a backend system in PHP (Symfony) and MySQL for the Java time tracking application.

Software Engineer (Part-time)
Studio Projectie | Mar 2012 - Jul 2012

- Enhanced web applications and APIs using PHP (Symfony), MySQL, and SOAP, contributing to more robust digital solutions.

Student (Major in Software Engineering)
University of Applied Sciences Leiden | Aug 2010 - Nov 2014

- Developed programming skills in Java, UML, SQL, and other technologies during software engineering studies.
- Awarded a Bachelor of Science (BSc) in Software Engineering.