# Lee Hickey

**Principal Engineer** | **Realtime & Distributed Systems**

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## Profile

- Ships realtime backends in Go end to end - pub/sub, presence, session relay and history - from online game servers and WebRTC and NATS JetStream systems to Pulse, a self-hosted room server.
- Builds engines, renderers, cook pipelines and simulation systems in C, C++ and on the GPU - most recently Unreal cook optimisation and a Vulkan 1.3 renderer.
- Considers performance from the architecture down: a different process flow, a better data structure, or a feature reshaped so a whole class of problems never arises.
- Delivered 40+ contract and in-house projects; led engineering teams of up to 30, ran a games studio for 12 years, and now directs coding agents the same way.

## Skills

**Primary:** Go (Golang), C, C++, Lua
**Secondary:** JavaScript, Python, Rust, Objective-C, C#, Solidity, OpenGL, Vulkan, GLSL, Slang
**Tools & Platforms:** NATS JetStream, WebRTC, Redis, AWS (ECS, Fargate, DynamoDB, S3), SQL, NoSQL, Unreal Insights, Superluminal, Git, Docker, Linux, MacOS, Windows, Nix

## Experience

### Founder & Principal Engineer — 11/2018 – Present

**Hidden Bridge Limited** — **Sheffield (UK)**

Independent software engineering consultancy. Sole engineer and director; contract delivery for greenfield, realtime and distributed backend projects.

**Selected contract engagements**

- **2026** - C++17 & Unreal Engine asset pipeline (cook) optimisations, profiled with Unreal Insights and Superluminal
- **2026** - Go & Python adversarial engineering tasks with automated grading that measurably defeat frontier AI coding models
- **2024** - Go & DuckDB distributed analytics/feature-flag backend, using NATS JetStream
- **2023** - Go & Svelte SaaS for brand UGC campaigns with an embedded Discord bot runtime - third engagement for PlayerState (2019, 2021, 2023)
- **2022** - Rust generative image pipeline, Go & Vue platform and Solidity contracts for a digital art/collectibles venture
- **2021** - JavaScript & WebGL 3D renderer and in-browser authoring tool for procedural fashion
- **2021** - Go, Rust & Vue platform for Ethereum-based collectible/customisable art project
- **2020** - C++17 & Vulkan 1.0 Mac/Windows apps with embedded WebRTC for remote screen-sharing
- **2020** - Go & Redis backend for WebRTC client - session relay, user presence etc
- **2019** - Refactored and streamlined 10+ Objective-C and Swift iOS apps for mobile telemetry company

**Skills**: Go, NATS, WebRTC, C, C++, Rust, JavaScript, Objective-C, Python, C#, Solidity, AWS (ECS, Fargate, DynamoDB, SES, S3), WebGL, OpenGL, Vulkan, Unity, Unreal, SQLite, DuckDB

### Principal Engineer — 06/2017 – 11/2018

**Fig.co (formerly Ownage Limited)** — **San Francisco (US)**

Community crowd-funding platform for computer games (like Kickstarter). Acquired Ownage Limited in Feb 2018

- Developed Ethereum-based platform for driving engagement
- Built Go backend and React frontend
- Developed Go CLI/SDK for per-project specialisation and React admin portal
- Wrote a C++11 SDK for Unity & Unreal
- Built iOS/Android wallet/authenticator using Flutter

**Skills**: Go, C++, Dart, Flutter, AWS (Fargate, DynamoDB, S3), JavaScript, React

### Lead Programmer | CTO | Owner
**09/2005 – 06/2017**

**Games Faction Ltd** — **Sheffield (UK)**

Independent games studio

- Created proprietary DirectX/C++03/Lua 3D game engine and associated tools for Windows/Steam
- Built proprietary OpenGL/C++11/Lua 2D/3D game engine and associated tools for iOS/Android
- Wrote proprietary, highly-scalable, async C++11/LuaJIT backend runtime - for online games
- Co-designed and developed 5 games, including award-winning **Project Aftermath** on Windows and the 50M+ downloaded iOS/Android hit **Storm the Train**
- Engineered 20+ iOS/Android applications for clients including DIAGEO and adidas
- Managed all day-to-day company running: recruitment, finance, legal, publishing, fund-raising etc

**Skills**: C++, Lua, Objective-C, Java, DirectX, OpenGL, Redis

### Lead Programmer | Technical Director
**03/1999 – 09/2005**

**Deep Red Games** — **Milton Keynes (UK)**

Independent game developer, focussing on PC/Console simulation games

- Launched 3 titles and developed 5 prototypes
- Engineered proprietary C++98 game engine, tech and simulation systems for numerous games/prototypes, including **Tycoon City:New York** and **Monopoly Tycoon**
- Built and ran a core-tech team of 8 engineers, creating all technology used across the studio
- As Technical Director, coordinated/managed all engineers (approximately 30) across studio

**Skills**: C, C++, Lua, Direct3D

### Programmer
**07/1996 – 03/1999**

**Gremlin Interactive** — **Sheffield (UK)**

Independent game developer and publisher

- Developed several PC and PlayStation 1 titles in C & C++98, including **Actua Soccer 2 & 3** and **Actua Tennis**

**Skills**: C, C++, x86, Direct3D

## Personal Projects

### Designer & Developer
**2025 – Present**

**Unannounced Game & Developer Tools** — **Sheffield (UK)**

- **Unannounced game** - competitive procedural tycoon sim: Townscaper-like building on an irregular grid meets Monopoly Tycoon-style rival businesses
  - **Cinder** - C99 & Vulkan 1.3 renderer; minimal API for programmatic render pipelines
  - **Pulse** - Go & NATS JetStream room server; rooms and presence in JetStream KV, fan-out over plain NATS, single binary
  - Procedural building system and economic simulation
- **Assay** - Go harness running Claude, Grok, Gemini and Codex agents in sealed containers; blind grading by hidden checkers, resumable runs, and a cheapest-first model ladder that stops on the first pass
- **Archr** - Go terminal tool for reading a project, annotating its architecture and reviewing changes against it; agents read and answer review comments through its CLI
- **Quire** - Go, Templ & Datastar site engine, markdown in and a single binary out; plugins with sessions and live Datastar SSE state, and an incremental image bake whose serving binary cannot encode

**Skills**: C, Vulkan, Slang, Go, NATS, Docker, Templ, Datastar

## Education

### University of Sheffield

BSc. Hons. | Computer Science