

Timothy Banks

Principal Engineer – Blockchain | High-Performance Systems | C++

Charlotte, NC • (260) 445-3389

timothyaaaronbanks@gmail.com

[GitHub](#) • [LinkedIn](#)

SUMMARY

Principal Engineer with 25+ years of experience delivering high-performance distributed systems across blockchain platforms, custody systems, consensus protocols, developer tooling, GIS engines, UAV video systems, runtime infrastructure, and defense applications.

Expert in **C++11/14/17/20/23**, WASM internals, compiler/LLVM tooling, consensus protocols (PBFT/Autobahn, CometBFT, Concord-BFT), EOSIO, EVM execution, and Bitcoin PoW.

Known for:

- Solving deep technical problems quickly
 - Leading major architectural redesigns
 - Creating tooling that accelerates entire engineering orgs
 - Raising engineering standards through rigorous code-review culture
-

CORE COMPETENCIES

Languages: C++11/14/17/20/23, C, Python, Java

Blockchain: PBFT/Autobahn, CometBFT, Concord-BFT, EOSIO/DPoS, EVM, WASM, Bitcoin PoW

Tooling: LLVM/Clang AST, static analyzers, WASM coverage, VM internals

Systems: High-throughput runtimes, MPC signing, consensus correctness

GIS: Raster/vector pipelines, terrain algorithms, projections, OpenGL

Leadership: Review culture, architecture ownership, mentoring

NOTABLE SYSTEMS & PROJECTS

- **Patent-pending SQL→KV semantic mapper** for blockchain data queries
- **WASM VM synchronous contract-call capability**

- **Hardhat cheatcode RPC support** (Somnia; >7,000 tests passed)
 - **WASM gcov/lcov coverage support** (longstanding org-wide blocker solved)
 - **macOS-native EOSIO toolchain** (eliminated Docker/VM dev dependency)
 - **DoD GIS engine beating ArcObjects/FalconView** on limited hardware
 - **UAV low-bandwidth video-streaming system** for iOS
 - **Chromalyzer** 2D/3D color engine w/ full color-space conversions
 - **Photosphere** co-founder — later acquired by Chameleon Power
-

EDUCATION

Purdue University

- **M.S. Mathematics**
- **B.S. Computer Science**
- **B.S. Information Systems**

EXPERIENCE

Somnia Protocol — Principal Protocol Engineer

2025 – Present

- Principal engineer for C++ EVM-compatible L1 blockchain using Autobahn PBFT consensus.
 - Added **full Hardhat cheatcode RPC support**, enabling protocol-level test compatibility with >7,000 Hardhat tests.
 - Designed decentralized **HTTP-outcall oracle network** performing consensus-verified off-chain requests for smart contracts.
 - Implemented protocol-level hardening: DDoS mitigation, validator-sanity rules, deterministic execution guarantees.
 - Promoted **deep, non-rubberstamped code-review culture** across the engineering teams.
-

Bullish (Block.one) — Principal Software Engineer, Custody

2023 – 2024

- Led custody architecture across MPC signing, WASM execution, smart contracts, cross-chain integrations, and state machines.
 - Delivered custody system under **fixed funding-dependent launch deadline**, despite shrinking team size.
 - Led complete redesign of the custody smart-contract architecture → achieved:
 - All future business requirements handled **without additional contract engineering**
 - Near-zero bugs and minimal triage load
 - Created **Clang AST-based static analyzers** catching upgrade-breaking contract patterns.
 - Implemented **WASM gcov/lcov coverage support**, enabling real test coverage for the first time.
 - Added **WASM VM context switching**, enabling synchronous multi-contract calls.
 - Built **rapid token-listing oracle** for integration across multiple blockchains. Allowed for chain indexing, transaction creation and signing per on boarded protocol.
 - Ported EOSIO to run **natively on macOS** (completed in one morning).
 - Reinforced rigorous code-review culture across product and protocol teams.
-

Bullish (Block.one) – Lead Software Engineer, Smart Contracts

2021 – 2023

- Implemented custody-critical smart contracts in C++/WASM.
 - Led team of five to deliver the 2022 Bullish Exchange launch.
 - Built deterministic contract state machines supporting custody, onboarding, compliance, and lifecycle management.
-

Block.one – Blockchain Engineer

2020 – 2021

- Maintained EOSIO core runtime: WASM execution, storage backends, multi-index, networking, block validation.
 - Integrated **RocksDB** backend.
 - Advocated for deep, thoughtful code-review rigor.
-

Amazon – Greengrass IoT – Software Engineer

2019 – 2020

- Built offline and SCIF-compliant edge compute features.
 - Migrated Python systems to 3.x; maintained C/C++ embedded interfaces.
-

ESRI – Principal Software Engineer

2013 – 2019

- First engineer on C++ runtime SDK rewrite.
 - Built **LLVM/Clang AST binding generator** for Java, Swift, .NET, Python, Obj-C, Qt.
 - Designed async operation models, rendering abstractions, and data-layer architecture.
-

Chameleon Power – Lead Software Engineer

2013 – 2014

- Rewrote visualization engine in modern C++ → **8× performance improvement**.
 - Added interactive room recoloring, flooring changes, tile visualization, and lighting simulation.
-

Chromalyzer – Lead Software Engineer

2013 – 2014

- Built 2D/3D color-analysis system w/ Lab, XYZ, HSV, RGB conversions.
 - Added palette-matching algorithms and coverage-optimization tools.
-

General Dynamics – Staff Software Engineer

2004 – 2012

- Lead engineer for high-performance **C++ GIS engine**, supporting many raster/vector formats (ASRP, CADRG, CIB, DTED, GeoTIFF, JP2, MrSID, NITF, VPF, KML, GPX, etc.) and projections (WGS84, Mercator, TM, Equirectangular, UTM, UPS, BNG) with complete MGRS grid support.
- Engine **significantly outperformed ArcObjects and FalconView** despite limited hardware.
- Implemented intervisibility, dead-ground, routing, raster pyramiding, vector-raster fusion, and OpenGL rendering.
- Designed **UAV video-streaming system** for extremely low-bandwidth networks → real-time drone feeds on iOS.

- Initiated migration from **Windows CE** → **Android**, solving major platform limitations.
 - Built Android mapping SDK outperforming ESRI's mobile SDK.
 - Contributed to ComBAT, Spartan, TiGR, TWV.
-

Photosphere – Co-Founder & Lead Engineer

2002 – 2004

- Built early photo-based room visualization engine supporting paint, flooring, and lighting changes.
 - Acquired by Chameleon Power.
-

SolutionPoint – Software Engineer

1999 – 2002

- Built Web 2.0 applications using ASP.NET, JavaScript, and C++.
-

TECHNOLOGIES

C++11-23, C, Python, Java, Rust, LLVM, Clang, WASM, EOSIO, EVM, PBFT, CometBFT, Concord-BFT, Bitcoin PoW, OpenGL, GDAL, MPC, Kubernetes, Docker, AWS, GCP, cmake, Linux, macOS

KEYWORDS

C++ • PBFT • Blockchain • WASM • EOSIO • EVM • Smart Contracts • GIS • UAV • LLVM • Clang • Distributed Systems • Consensus • High-Performance Computing • Protocol Engineering • MPC • Developer Tooling • Raster/Vector • OpenGL