Tim Illguth

Blockchain Developer & Security Engineer

Tim Illguth
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Skills

Blockchain security engineer with deep experience designing, auditing, and deploying production-grade Solidity smart contracts across Ethereum mainnet and testnets. Skilled in identifying and mitigating common and advanced exploit vectors including reentrancy, flash-loan attacks, MEV/sandwich attacks, and oracle manipulation through a combination of manual review and automated analysis using tools such as Slither. Experienced building secure DeFi systems including AMMs, DAOs with on-chain governance, multisig treasuries, NFT platforms, crowdsales, and private EVM chains.

Extensive background in application and infrastructure security, applying secure-by-design principles across the full SDLC. Proven expertise in threat modeling, vulnerability management, and incident response, with a track record of reducing external attack surfaces through automation and continuous monitoring. Strong working knowledge of Zero Trust Network Architecture (ZTNA), compliance-driven environments (FISMA, NIST 800-53, PCI-DSS), and integrating fraud-detection controls into large-scale payment and transaction systems.

Seasoned systems and cloud engineer with 14+ years of Linux systems administration in mission-critical, highly regulated environments. Hands-on experience securing and operating containerized platforms using AWS: IAM, Kubernetes, K8s, K3, Docker, and Helm, alongside hardened network design, CI/CD security practices, and large-scale distributed system reliability.

Proficient in Solidity, Python, JavaScript/TypeScript, Bash, C++, and Next.js, with ongoing development in Rust and Go. Known for technical leadership, mentorship, and security education, including guiding engineers in threat modeling and incident response, developing technical curricula, and collaborating effectively across engineering, security, and compliance teams.

Experience

Bass Pro Shops — Systems Engineer III
Nov 2024 – Present | Branson, MO

- Leading modernization and security hardening of nationwide retail payment and transaction systems supporting high-volume, multi-state operations.
- Designed and delivered a PCI-DSS–compliant platform with integrated fraud-detection hooks, improving transaction integrity and reducing operational risk.
- Collaborated cross-functionally with engineering, security, and business stakeholders to deploy secure, scalable solutions ahead of schedule.

NASA Earthdata Distributed Active Archive Center (DAAC) — Systems & Network Security Engineer
2010 – 2024 | Fairbanks Alaska

- Secured and operated mission-critical, petabyte-scale data distribution systems supporting global scientific research.
- Implemented Linux system hardening and network security controls in compliance with FISMA and NIST 800-53 requirements.
- Designed and deployed Zero Trust Network Access (ZTNA) solutions and led vulnerability management and threat modeling initiatives, reducing external attack surface by approximately 40%.
- Migrated legacy applications to containerized Kubernetes environments using Docker and Helm, improving reliability and security posture.
- Mentored engineers on incident response, secure system design, and operational security best practices. OSPF, BGP network split design for Contracts, DOD and Mars DTN network.

Education

School Name / Degree
Aug 2006 - Dec 2010,

Electrical and Computer Engineering major with a math minor. 3.9 GPA. Hired at NASA full time halfway through junior year and now finishing up online by ‘28

Projects

Automated Market Maker (AMM) DEX — Ethereum

Solidity, Hardhat, React, ethers.js

Designed and implemented a decentralized exchange on Ethereum using a constant-product Automated Market Maker (x·y = k), supporting secure ERC-20 token swaps and on-chain liquidity provision. Architected and developed production-quality Solidity smart contracts for swapping, liquidity management, and share accounting, with built-in slippage protection and invariant enforcement. Wrote comprehensive unit tests with Hardhat and validated contract behavior under edge cases including low liquidity and extreme price movement.

Built a full-stack Web3 application with a React frontend and Redux state management, integrating wallet connectivity via ethers.js and providing real-time visualization of pool reserves and trading activity using ApexCharts. Implemented deployment and seeding scripts, contract address management, and environment configuration to support local, testnet, and mainnet workflows. Applied secure smart-contract design principles and manual review to mitigate common DeFi risks, reinforcing a security-first development approach aligned with real-world AMM architectures (Uniswap V2–style).

Patent NFT Marketplace — Web3 Proof of Concept

https://nft-patents.vercel.app/

Solidity, Hardhat, React, IPFS, Express, Ethereum (Sepolia)

Designed and built a full-stack Web3 marketplace demonstrating how publicly available patents can be tokenized, discovered, and traded using decentralized infrastructure. Developed Solidity smart contracts for ERC-721 patent NFTs, marketplace listings, and multi-token payments (ETH, USDC, custom ERC-20), incorporating security controls such as reentrancy protection, access control, pausable contracts, and on-chain uniqueness enforcement to prevent duplicate patent minting.

Architected a serverless backend API to securely integrate Google Patents search data, process patent PDFs, and pin NFT metadata to IPFS without exposing credentials, enabling a fully decentralized, database-free design. Implemented a React-based frontend with wallet integration, rich patent metadata display, and end-to-end flows for search, minting, listing, and secondary-market trading. Designed the system with graceful feature degradation, supporting optional AI-assisted patent search while maintaining full functionality without paid services.