

Tim Illguth

NASA Network Security - Blockchain Security Developer - Inventor - Author - Speaker

3515 Arlene Dr
Branson, MO 65616
(907) 483-***

timillguthak@gmail.com

<https://timillguth.com>

ENS: timillguth.eth | GitHub:

<https://github.com/pttransamdriver>

PROFESSIONAL SUMMARY

Accomplished blockchain security engineer with 4+ years in Solidity smart contract development and 14+ years securing distributed systems at NASA, transitioning expertise to build secure, scalable onchain infrastructure. Proficient in architecting protocols for DeFi (AMMs, DAOs, NFTs), auditing for vulnerabilities like reentrancy, oracle manipulation, MEV, and flash-loan attacks using Slither, MythX, and manual reviews, while deploying to Ethereum mainnet and testnets. Experienced in backend development with JavaScript/TypeScript, Python, Rust, and Go, including full-stack Web3 apps with Next.js and ethers.js. Passionate about contributing to the crypto ecosystem through open-source projects and standardizing interfaces for decentralized platforms—eager to drive Base's OP Stack decentralization and onboard billions onchain with robust, NASA-grade reliability.

EXPERIENCE

Bass Pro Shops, Springfield, MO — Systems Engineer

Nov 2024 - PRESENT

Lead in modernization, containerization and security hardening of nationwide retail payment and transaction systems supporting high-volume, multi-state operations. Integrated Secure Payments

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 DAAC ASE, Fairbanks, AK — Network Security Eng

April 2012 - April 2024 (14 Years)

Architected distributed systems akin to web3. Mars DTN network and BGP/OSPF. Secured and operated mission-critical, petabyte-scale data distribution systems supporting global scientific research.

SKILLS

Blockchain & Smart Contract Security

Smart Contract Auditing & Vulnerability Assessment (Slither, MythX, manual code review)

Common & Advanced Exploit Mitigation (Reentrancy, Flash-Loan Attacks, Oracle Manipulation, MEV/Sandwich Attacks, Access Control Issues)

Secure Solidity Development & Best Practices (OpenZeppelin libraries, upgradeable contracts, pausable logic, timelocks)

DeFi Protocol Security (AMMs, DAOs with governance/quadratic voting, multisig treasuries, crowdsales, NFT royalty enforcement)

On-Chain Security & Threat Modeling (Ethereum mainnet/testnet deployments, private EVM chains)

Programming & Development

Solidity (4+ Years)

JavaScript/TypeScript, Python (automation/scripting), Bash

Next.js (full-stack Web3 apps), ethers.js, Hardhat

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.

Freelance, Remote US — Blockchain Security Engineer

April 2024 - Present

Deployed a full-stack AMM flash-loan trading application on Ethereum using Solidity, Hardhat, and ethers.js; implemented secure flash-loan mechanics with reentrancy guards, slippage protection, and invariant enforcement, enabling arbitrage simulations and liquidity provision while mitigating MEV/sandwich attacks—tested on Sepolia testnet with edge cases for extreme market volatility.

Architected an NFT trading platform (Patent NFT Marketplace PoC) in Solidity and React/Redux, integrating ERC-721 standards, IPFS for decentralized metadata, and multi-token payments (ETH, USDC, ERC-20); incorporated security features like access controls, pausable logic, timelocks, and uniqueness enforcement to prevent duplicate minting—deployed to Sepolia and demonstrated in hackathons, attracting user engagement for real-world asset tokenization.

Built a DAO governance system from scratch using Solidity and OpenZeppelin libraries, featuring quadratic voting, multisig treasuries, and crowdsale mechanisms; audited for vulnerabilities (oracle manipulation, governance attacks) via Slither, MythX, and manual reviews—integrated with frontend in TypeScript/React for proposal submission and voting, ensuring secure on-chain decision-making aligned with DeFi best practices.

Completed DAPP University curriculum, gaining advanced proficiency in blockchain development; applied learnings to build 3 full-stack Web3 websites in the "World's Largest Hackathon" using JavaScript/TypeScript, HTML/CSS (Tailwind), React, and WordPress—focused on secure wallet integrations and dApp UIs for various companies, enhancing user adoption and interoperability.

Rust and Go for backend optimizations in private EVM chains and infrastructure tools, alongside Python/Bash scripting for automation; collaborated with AI tools (Claude Code, Amazon Q, Gemini) to accelerate development cycles, resulting in production-ready prototypes with gas-optimized contracts and reduced deployment risks. Conducted threat modeling

Rust & Go (active)

C++ (Instructor Proficiency)

Systems & Infrastructure Security

Zero-Trust Network Access (ZTNA)

Design & Implementation
(Fortinet)

Linux Systems Hardening &
Administration (petabyte-scale,
FISMA/NIST 800-53 compliant)

Containerization & Orchestration (Kubernetes, Docker, Helm)

Vulnerability Management &
Automation (Nessus, Python/Bash
scripting, 40% attack surface
reduction)

Compliance & Risk Frameworks
(PCI-DSS, FISMA, NIST 800-53)

Tools & Platforms

Ethereum Ecosystem (Mainnet,
Sepolia, Hardhat, IPFS)

Web3 Integration & Full-Stack
Development (React/Redux, wallet
connectivity)

Cryptography Fundamentals
(hashing, elliptic curves, secure key
management)

CI/CD & DevSecOps Practices
(secure pipelines for blockchain
projects)

Soft & Leadership Skills

Technical Mentorship & Threat
Modeling Training (mentored 8+
engineers at NASA)

Cross-Functional Collaboration
(engineering, security, compliance
teams)

EDUCATION

University of Alaska, Fairbanks — B.S *Electrical and Computer Engineering*

Aug 2006 - Dec 2012

GPA 3.8 Hired on with NASA halfway through my Junior year. Now finishing up classes remotely after a long professional pause. Taking CE courses expected Graduation now 2028.

PROJECTS

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.

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 ($xy = k$), 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

Incident Response & Risk
Assessment in Mission-Critical
Environments

AWARDS

Blockchain Architect - 101
Blockchains

Blockchain Developer - Dapp
University

Linux Engineer - LPIC

Juniper Network Engineer - Juniper
Labs

Network Security Engineer 4 -
Fortinet

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).