

EXPERIENCE

Software Engineer

Amboss Technologies  ambossTech

Nov 2024 – Present
US (Remote)

- Contributing to a Bitcoin-native decentralised exchange (**DEX**) built on Taproot Assets Protocol (TAP) and the Lightning Network, enabling trustless swaps and trades of Taproot-native assets
- Built **Amboss L402** — a Lightning-native API monetization service gating multiple endpoints (IP geolocation, crypto market data, Lightning channel recommendations, web scraping, and LLM/RAG completions via OpenAI) behind L402/LSAT micro-payments, enabling pay-per-use API access without subscriptions
- Designed and built a centralised **OAuth 2.0** authentication system with 2FA (TOTP) as the single sign-on identity layer shared across all Amboss products
- Contributed to **Amboss Rails**, a self-custody Bitcoin yield platform on the Lightning Network; users deploy funds to their own node and earn yield without surrendering custody
- Contributed to **Amboss Magma**, the largest peer-to-peer Lightning liquidity marketplace; enables node operators to buy and sell channel liquidity using HODL invoices as trustless smart contracts
- Designed and maintained GraphQL and RESTful API design (NestJS, TypeScript) powering multiple Amboss products; worked with product and business teams to scope and ship features end-to-end from API to frontend (Next.js/React) and contributed to QA
- Integrated LND gRPC APIs for channel management, routing, and liquidity operations; scripted and automated end-to-end Taproot Assets flows in Python for testing and internal tooling
- Contributed to Kubernetes workload management (Deployments, Services, ConfigMaps) and Helm charts within a microservices architecture; maintained CI/CD pipelines on AWS for reliable container delivery
- Monitored services using Datadog (dashboards, APM, log pipelines, alerts); contributed to **SOC 2** compliance controls, audit logging, and access policies

Software Developer

Bitcoin.org (CoinSwap)  citadel-tech

Nov 2023 – Oct 2024
US (Remote)

- Maintained **CoinSwap**, a privacy-focused atomic swap protocol for Bitcoin/(contributed as one of the core library maintainers)
- **Achieved 28.8%** storage efficiency by transitioning wallet data to binary CBOR encoding
- **Reduced latency by 21.7%** in integration tests by optimizing encoding/decoding of [protocol messages](#)
- Owned the Rust API documentation; led the App Cleanup milestone — removed legacy code, modularized architecture, and overhauled the wallet configuration system

Software Developer, Summer of Bitcoin

CoinSwap  citadel-tech/coinswap

May 2024 – Sep 2024
US (Remote)

- Replaced the CoinSwap wallet with a new implementation built on **BDK**, constructing wallet infrastructure from scratch using BDK's chain interfaces and data structures
- Reimplemented core components (WalletStore, Wallet) and their APIs; modularized the codebase for maintainability and scalability
- Introduced Fidelity and SwapCoin variants to the KeychainKind enum for improved key management
- Redesigned wallet configuration — migrated sensitive path fields, improved secure data handling, and integrated RPC synchronization support

Software Developer, Google Summer of Code

XWiki  xwiki-contrib/application-interactive-link-visualizer

May 2023 – Sep 2023
France (Remote)

- Built an interactive link visualizer for XWiki — a graph of interconnected wiki pages with a customizable panel for localized display around the current document
- Added features including node search, **Solr** Search Facets, query filters, zoom controls, iteration adjustments, result filters, and theme compatibility
- Integrated XWiki APIs to extract detailed page data (backlinks, titles, URLs, doc references) dynamically
- Made **165+** commits, resolved **30** Jira issues, and contributed to the [core XWiki platform](#) beyond the primary project
- Documented the tool on the [XWiki Extensions page](#), published a [blog post](#), and created a [YouTube demo](#)

TECH SKILLS

AI & Tooling	Claude Code, Cursor, MCP (Model Context Protocol), LLM API Integration, GitHub Copilot, OpenAI
Backend Languages	Node.js, NestJS, gRPC, REST, GraphQL, Apollo Studio, PostgreSQL, Redis, OAuth 2.0, JWT
Frontend	Python, TypeScript, JavaScript, Rust, Go, C/C++, Shell Scripting
Bitcoin	Next.js, React, D3.js, Graphology, SigmaJS
Lightning	Bitcoin Protocol, Taproot Assets Protocol (TAP), BDK, Ordinals, Runes
DevOps & Cloud Tools	Lightning Network, LND, Lightning Terminal (LITD), L402 (LSAT), Polar, Voltage AWS, Kubernetes, Docker, CI/CD, Datadog, GitHub Actions, Linear Git, NPM, Jira, Apache Solr, Apache Maven, Selenium

ACHIEVEMENTS

SoB 2024	Selected in Summer of Bitcoin out of 5000+ applicants from 50+ countries	2024
LFX 2024	Selected in Linux Foundation Mentorship out of 10,000+ applicants from 63+ countries	2024
GSoC 2023	Selected in top 2% of 43,765 applicants ; delivered 350-hr project with all features in 1.5 months	2023
MLH 2023	Selected in Major League Hacking Fall 2023 under Software Engineering track	2023
CodeChef	(Data Structures & Algorithms) May 2022 Long Challenge II & I, secured Global Rank 1 & 143 respectively	2022
Hacktoberfest	Completed twice with 50+ pull requests merged	2022, 2023
Contributions	1024+ total pull requests merged (open-source & private) including Thunderhub , Bancolibre , Rust Bitcoin , BDK , Sigma.js & more; freelanced on GreatWall	2020–Present
Technical Writing	Maintain Thunderhub Lightning docs ; co-maintain Amboss internal documentation; author tech blog covering Bitcoin, Go, and web development	2022–Present

PROJECTS

L402 Playground

- *Interactive browser-based explorer for the L402 Lightning authentication protocol* [wthrajaat/l402-playground](#)
TypeScript, Vite, Web Crypto API, CSS
- Simulates the full L402 (bLIP-0026) flow: HTTP 402 challenge, Lightning invoice generation, preimage verification, and macaroon-based access
 - Generates cryptographically valid preimage-hash pairs via Web Crypto API; all protocol logic runs client-side with zero external dependencies
 - Live interactive demo deployed at [here](#)

Lightning Capacity Chart

- *Visualizes Lightning Network node capacity over time using Amboss API* [wthrajaat/lightning-capacity-chart](#)
TypeScript, Node.js, Amboss API, HTML
- Fetches Lightning Network node capacity metrics from the [Amboss API](#) and generates an interactive HTML chart
 - Supports multi-node comparison with configurable public keys, node names, and custom date ranges via `.env`
 - Outputs a self-contained HTML file and auto-opens it in the browser

Seamcarving

- *Content-aware image resizing algorithm implemented in C++* [wthrajaat/seamcarving](#)
C++, OpenCV, CMake, Glew
- Resize images while preserving important features and content, demos and examples given
 - Utilizes dynamic programming for efficient seam identification and removal

NPM Support in WebJars

- *Enables to use NPM packages & TS through WebJars* [wthrajaat/npm-in-webjar](#)
NPM, TypeScript, Apache Maven, Java
- WebJars don't inherently support NPM packages & TypeScript out of the box; not anymore!
 - Using this, one can use NPM packages & TypeScript's features into web applications through WebJars

EDUCATION

Bachelor of Engineering, [Panjab University](#) Year: 2025, Grade: 7.25/10

High School, [CBSE](#) Year: 2020, Grade: 9.56/10