Freddy Li

Senior Blockchain Engineer at ChainSafe Systems(Toronto, ON Canada) · M.Eng(SE) from University of Waterloo

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Skills

- Rust, Golang, EVM, Polkadot, Substrate, Consensus, Distributed Systems, Cross-chain messaging and bridging, Concurrency, P2P Networking(Libp2p, Kademlia DHT), Redis, PostgreDB, Docker, AWS, Linux, Git

Working Experience

ChainSafe Systems - Gossamer(Polkadot Go Implementation)

Global

Senior Blockchain Engineer - Protocol

Feb. 2025 - Now

- Tech Stack: Rust, Go, Polkadot, Libp2p, Kademlia DHT, Concurrency, Distributed message gossip system
- Delivered core components of a full blockchain node, partnering with protocol, runtime, and networking teams to implement consensus, P2P systems, and state-machine logic.
- Took lead ownership of backend subsystems supporting block production and candidate lifecycle workflows, driving design, architecture, and high-quality implementation.
- Designed and engineered distributed modules for candidate signing, distribution, and validation, coordinating with cross-functional teams to ensure correctness, performance, and alignment with protocol specifications.

ChainSafe Systems - Sygma(Decentralized Crosschain Bridging EVM-Polkadot)

Global

Senior Blockchain Engineer - Crosschain Bridging

Jul. 2021 - Mar. 2025

- Tech Stack: Rust, EVM, Polkadot-Substrate Pallet, Multi Party Computation, ECDSA verifier, Runtime Development
- Led development of a cross-chain bridging protocol connecting multiple blockchain networks such as EVM and Polkadot, driving design, implementation, and deployment of core bridge components.
- Engineered backend modules for runtime integration, cross-ecosystem interoperability, and relayer communication.
- Owned end-to-end mainnet and testnet bridge deployment, configuration, and execution.
- Built scalable onboarding processes for new networks, ensuring reliability, performance, and seamless interoperability.
- Collaborated with cross-functional teams to align protocol design with production requirements and multi-chain standards.

ChainSafe Systems - Cosmos-SDK Module for Chainlink Oracles

Global

Blockchain Engineer - Protocol

Jan. 2021 - Aug. 2021

- Tech Stack: Go, NodeJS, Cosmos-SDK, IBC, Tendermint, Chainlink
- Developed Cosmos SDK module integrating oracle functionality, taking ownership of backend development in Go.
- Upgraded the consensus and application layers for compatibility with core blockchain protocols and virtual machine execution.
- Improved RPC interfaces to support efficient communication between the module and external services.
- Led end-to-end module development, from protocol-level implementation to testnet deployment, strengthening system design.

BitSpawn - Deposit Manager(EVM-Solana)

Toronto. ON. Canada

Blockchain Payment System Engineer

Jul. 2019 - Dec. 2021

- Tech Stack: Go, NodeJS, BitCoin, Solana, Ethereum, Solidity, Etherscan-api, BlockCypher-api, ERC-20, PostgreSQL, Redis, Bloom Filter, HD wallet, KMS, BitGo, Paypal, Stripe
- Designed and implemented a blockchain payment system handling multi-token deposits, minting, and burning across chains.
- Built end-to-end backend logic, including real-time monitoring, automated processing, and production deployment on AWS.
- Enabled cross-functional teams to access reliable payment data for business decisions, acting as a core gateway for broader on-chain application logic.
- Fully responsible for system architecture, development, and operational reliability, demonstrating ownership of complex cross-chain processes.

OneLedger *Toronto. ON. Canada*

Blockchain Backend Engineer *Apr. 2019 - Jan. 2021*

- Tech Stack: Go, Typescript, NodeJS, Tendermint, PBFT, LevelDB, Hierarchical Deterministic key Derivation, PostgreSQL, SQS, Linux
- Developed hierarchical deterministic (HD) wallet supporting BTC, ETH, and native chain key derivation.
- Designed and implemented user-friendly blockchain SDK, enabling developers to interact with the protocol effectively.
- Built blockchain explorer to track and visualize onchain data, improving accessibility and usability.
- Actively collaborated with the team, incorporating feedback in fast improvement cycles while strengthening design and implementation skills.

SkyQuark *Toronto. ON. Canada*

Blockchain Application Engineer - Dapps *Oct. 2017 - Apr. 2019*

- Tech Stack: Ethereum, geth, parity, Solidity, Truffle, Mist, IPFS, EOS, Docker, koa framework

BlackBerry *Waterloo. ON. Canada*

Security Platform Automation Engineer Intern *May. 2017 - Dec. 2017*

Oracle Corporation *Tianjin, China*

Interal Systems Backend Engineer Intern *Mar. 2014 - Feb. 2015*

Highlight Projects

ChainSafe Systems - Sygma

https://github.com/sprintertech/sygma-substrate-pallets *Jul. 2021 - Mar. 2025*

- ChainSafe Sygma is a decentralized cross-chain messaging protocol. It supports ERC20, ERC721 and generic message passing between any EVM based chain; and reserved, non-reserved token transferring between EVM and polkadot.
- Led design and full ownership of cross-chain bridging modules, including runtime development and Substrate pallet implementation for mainnet, testnet, and local testnet environments.
- Improved destination chain voting by moving it from on-chain to off-chain, reducing gas costs while increasing throughput and system efficiency.
- Collaborated closely with EVM team to ensure MPC processes, including key generation and key sharing, met production-level security standards.
- Designed and developed independent Substrate pallets with cross-chain messaging support, enabling Sygma integration on any Substrate-based chain (parachain or parathread).
- Integrated Sygma with multiple chains including Phala Polkadot mainnet, its Kusama testnet; Tangle standalone parachain, Asset Hub, and Bridge Hub, solving multi-chain interoperability challenges.
- Built and maintained CI/CD pipelines and feature upgrade workflows for local, public testnet, and mainnet deployments using Docker, enabling fast feedback and iterative improvement.
- Coordinated across time zones with partner teams to resolve issues and deliver features effectively, ensuring smooth cross-organization collaboration.

ChainSafe Systems - Cosmos Chainlink Module

https://github.com/ChainSafe/chainlink-cosmos *Jan. 2021 - Aug. 2021*

- Cosmos Chainlink module is one of the Cosmos SDK modules that designed and developed by ChainSafe Systems.
- Participated as Tech lead in this project.
- It links Cosmos and Chainlink ecosystems so that community developers are able to submit/retrieve the feed data from Chainlink in the Cosmos ecosystem.
- Hierarchical management design makes sure the validity of the oracle data. Each data feed maintains its own owner list and data provider list.
- Token rewarded to the valid data provider each round.
- Business agnostic design makes the module generic in any kind data.

BitSpawn - Deposit Manager

Private Github Repo *Jul. 2019 - Dec. 2021*

- Designed and implemented the Deposit Manager (Golang + NodeJS), a centralized payment gateway handling multi-currency deposits and withdrawals, including ETH, BTC, ERC20/SPL tokens, and USDC, with automated minting/burning of internal SPWN tokens.
- Built APIs for real-time currency exchange rates and internal token conversions, enabling other backend services to integrate seamlessly.
- Developed a Cobra CLI for auxiliary features, including token migration, KMS encryption/decryption, admin mint/burn/transfer, smart contract deployment, HD wallet management, and transaction reporting.
- Ensured multi-platform withdrawals and robust block/transaction catch-up mechanisms to maintain system reliability.
- Designed a highly configurable system with switchable deposit/withdraw options and both automated and manual workflows.
- Applied a finite-state-machine architecture to allow scalable growth and maintainable future enhancements.
- Implemented admin-customizable smart contracts to guarantee atomicity of deposit and withdrawal operations.
- Worked independently while actively communicating with multiple teams to explore balanced technical solutions, optimize processes, and resolve integration challenges.
- Continuously iterated and self-learned to improve system performance, security, and usability, supporting 170,000 monthly active users by January 2022.

OneLedger - L1 Blockchain Protocol

https://github.com/Oneledger/protocol *Apr. 2019 - Jan. 2021*

- OneLedger blockchain is one of the public Blockchain networks which aims to build enterprise level Interoperability and open source for community to build dApps.
- Using Tendermint as core consensus engine, OneLedger chain has application(node) layer, RPC layer, transaction verification /distribution layer and chain state distributed database(LevelDB) layer on fullnode and validator node.
- RPC layer: designed and implemented RPC endpoints for transaction and query.
- Transaction layer: designed and implemented transaction verification(signature mapping) for all transaction types, transaction fee charge logic, fee collection and reward withdrawal for validators.
- Distributed Database layer: designed and implemented database schema and store structure for different transaction types and block info.
- Block scope: designed and implemented block beginner and block end for internal transaction logic.
- Transactions: OneLedger Domain Service, Governance, Staking&Delegation, Block Rewards, Multi-currency Transfer, ETH/OLT Interoperability.

OneLedger - Hierarchical Deterministic(HD) Wallet

Private Github Repo *Jun. 2019 - Apr, 2020*

- OneLedger HD Wallet is a TypeScript module that provides ability to generate keypairs and sign Raw Transactions for multiple chains.
- Support configurable entropy to derive master seed.
- Support whole wallet backup and recovery from any device by mnemonic.
- Support BTC, ETH and OLT(OneLedger) keys derivation, address verification and transaction signing.
- Hide derived master seed and all private key to maximum security.
- Using hardened extended key path from BIP-39.
- Easily extendable to support other blockchain key algorithm.
- Supported on Ledger Hardware device.

Education

Polkadot Blockchain Academy Wave 7

Bali, Indonesia

Protocol Track Graduation *Aug. 2025 - Sept. 2025*

University of Waterloo

Waterloo. ON. Canada

Master of Engineering (Software Engineering) *Sept. 2015 - Dec. 2017*

Tianjin University of Technology

Tianjin. China

Bachelor of Software Engineering *Sept. 2011 - Jun. 2015*