Khoa Phan (Phan Đăng Khoa)

Polyglot Systems, Web3 & Custom MCP Architect

Rust • Go 1.22+ • TypeScript • Python • WebAssembly

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01 // EXECUTIVE SUMMARY

Senior Systems & Full-Stack Software Engineer with 5+ years of production experience across Rust, Go, TypeScript, and Python. Backed by 20 live merged upstream open-source pull requests (Stellar/Soroban XDR, Anza Solana SBF compiler tooling, official Solana Foundation examples, Altacon-Labs/RevMarket SQLite & proxy rate-limiting, tldr-pages 64k+ stars), 6 MIT-licensed open-source repositories (4 GPG-signed core guardkits), and stateful Agent-Native Python CLI infrastructure (--json + Undo/Redo). Specialized in kernel-contained Custom MCP servers, idempotent FinTech payment pipelines, and deterministic automated verification.

02 // TECHNICAL SKILLS

- **Languages:** Rust (WebAssembly / `wasm-bindgen`), Go 1.22+ (`go test -race`), TypeScript / JavaScript (Node.js, ES2024), Python 3.10+ (`asyncio`, `ctypes` Win32), SQL (PostgreSQL, SQLite WAL).
- **AI & MCP Infrastructure:** Custom MCP Server Architecture (stdio, TCP loopback, Streamable HTTP), Windows Job Object / POSIX cgroup process containment, W3C SSE cross-chunk DLP, adversarial LLM evaluation.
- **Web3, 3D Web & Frameworks:** Stellar Soroban (RFC 4506 Binary XDR), Solana Anchor / SBF, Cloudflare Workers & Durable Objects, FastAPI, Next.js / React 19, Three.js / WebGL / VRM.

03 // VERIFIED UPSTREAM OPEN-SOURCE RECORD (20 MERGED PRS)

- **Externalize-Labs/externalize (PR #39 Merged):** Exported cryptographic `proveAncestor` ledger ancestry verifier to WebAssembly (`wasm-bindgen`) with strict `certified_seq` bounds (commit `a927da3`, 11/11 CI green).
- **anza-xyz/cargo-build-sbf (PR #116 Merged) & solana-foundation/program-examples (PR #760 Merged):** Consolidated canonical `solana_define_syscall::definitions::SYSCALLS` into Anza's Solana SBF Cargo builder and merged PDA Rent-Payer caller `authority` security docs into Solana Foundation (commit `a9446bc`).
- **Altacon-Labs/RevMarket (PR #42, #56 & #57 — 3× Merged):** Implemented durable `SQLite` checkpoint event indexing, separated verified wallet activity from client reports, and scoped draft/AI rate limits behind trusted proxies.
- **sorotrail/SoroBeacon (PR #680 Merged) & tldr-pages/tldr (PR #24925 Merged):** Generated typed Python client SDK from OpenAPI spec and authored official `stellar-cli` command reference (64k+ star repo).
- **Additional Upstream Merges & Credits:** Merged `ritik4ever/stellar-stream#1436`, `Farm-credit/stellar-app-os#1797..1799` (3×), `ritik4ever/stellar-goal-vault#1377..1379` (3×), `Wayfare-labs/wayfare#860`, and `MMM-pay/payflow-docs#107`; boundary-test credit on `BasedHardware/omi#23591` (8k+ stars); active open PRs at `aibtcdev/x402-api#150` and `wraith-protocol/contracts#285`.

04 // PRODUCTION EXPERIENCE & AUTHORED MIT TOOLKITS

Independent Systems, Web3 & AI/MCP Architect

2023 – Present • Global Remote

- Authored and maintain **6 MIT-licensed open-source repositories**: `soroban-xdr-proof-kit` (Rust/Wasm), `go-preflight-sql-guard` (Go 1.22+), `ts-idempotent-webhook-guard` (TypeScript WAL Lock), `py-stream-and-billing-guard` (Python SSE DLP & ISO-4217), `solana-validator-ordering-post-alpenglow`, and `Master-Lab`.
- Architected a 30-tool production Custom MCP bridge (76/76 unit, boundary & adversarial stress tests passing) with < 210ms TCP RST socket recovery and zero-zombie Windows Job Object containment.
- Engineered deterministic `--json` Python CLI harnesses (with atomic Undo/Redo session persistence) and 60-FPS interactive WebGL 3D browser applications (khoaphan.dev/arcade/).

Head of R&D (Digital Platforms & Systems Engineering) — APECGLOBAL Economic Group

2020 – 2023 • Ho Chi Minh City, Vietnam (Past Role)

- Spearheaded R&D architecture across enterprise portals, e-commerce transaction systems, high-throughput payment webhook processors, REST/GraphQL APIs, and PostgreSQL/SQLite schemas across APECGLOBAL (2020–2023) & ECOOP (2020–2023 • Past Role) subsidiary initiatives.

05 // INDEPENDENT CS RESEARCH & LANGUAGES

Self-Directed Engineering: Distributed Systems, Cryptography & Systems Programming (18+ Merged PRs)

English (Written Technical Working) • Vietnamese (Native)