Marcus Girolneto Sousa

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PROFESSIONAL SUMMARY

Senior Software Engineer with 9+ years building backend systems that must stay correct under load and under attack: payments, distributed protocols and AI security. Designed and built Constellation Gate from zero, a multi-tenant security gateway for LLM applications, then led its engineering team. Six years on a production Scala consensus protocol, including live-network incident response. Hands-on in TypeScript, Node.js, Scala and PostgreSQL; owning design, delivery and operations end to end.

WORK EXPERIENCE

Specialist Software Engineer / Tech Lead, Constellation Gate | Constellation Network | Sep 2025 - Oct 2026 | Remote

- Designed and built Constellation Gate from zero, a multi-tenant security gateway for LLM applications and AI agents, then led its engineering team as the product grew.
- Owned architecture, application, infrastructure and database end to end; shipped prompt-injection detection, sensitive-data scanning, prompt compression, response caching and verifiable audit records.
- Co-authored public Gate AI LLM Security Benchmark: 97.4% F1 at 1% false-positive rate across 16 datasets (12,111 samples), first place on 8 datasets; reproducible methodology and published results.
- Concurrently worked on core Scala protocol: consensus, snapshot rollback and recovery, L1 synchronization, state proofs, delegated staking and Merkle Patricia Trie performance.
- Investigated and resolved production incidents on a live network, including a mainnet restart loop; shipped recovery and release fixes under time pressure.
- Built deployment, monitoring, auto-restart and snapshot-streaming tooling for node operators and partner teams.

Technologies: TypeScript, Python, Scala (cats-effect), PostgreSQL, Redis, AWS, Docker, GitHub Actions

Senior Full Stack Software Engineer | Constellation Network | May 2022 - Aug 2025 | Remote

- Built applications, developer tooling and production services across a distributed-ledger ecosystem.
- Maintained a production application across mainnet and testnet for an IoT partner: protocol upgrades, release versioning and reward-distribution logic.
- Built remote deployment tooling with Ansible and Docker to start clusters, inspect status and retrieve logs from remote infrastructure in one command.
- Delivered reward features, a third-party exchange API integration and daemon health checks for a consumer-facing application.
- Developed monitoring and auto-restart tooling for transaction pipelines, reducing manual intervention on failures.

Technologies: Scala, TypeScript, Node.js, React, AWS, Docker, Ansible

Senior Software Development Engineer | PagSeguro PagBank | Aug 2021 - Mar 2022 | Brazil

- Helped lead modernization of a monolithic application into microservices at a major Brazilian fintech.
- Designed and implemented services in Node.js/TypeScript and Java/Kotlin (Micronaut); owned delivery through Jenkins CI/CD and supported engineers through design and code reviews.

Full Stack Developer | Sistema Saipos | May 2021 - Aug 2021 | Brazil

- Delivered features, automated tests and production fixes for restaurant-management SaaS; optimized PostgreSQL and Oracle queries.

Technologies: Node.js, TypeScript, React, AngularJS, AWS Lambda, SQS, DynamoDB

Software Developer | ZG Soluções | Oct 2017 - May 2021 | Goiânia, Brazil

- Delivered product features and customer-reported fixes in Java/Groovy and JavaScript; maintained CI/CD and automated tests with JUnit and Jest.

Technical Support Analyst | SIACON | Apr 2017 - Oct 2017 | Goiânia, Brazil

- Investigated software issues and deployed products for customers.

TECHNICAL SKILLS

Languages: TypeScript, JavaScript, Scala, Python, Java, Kotlin, Go

Backend: Node.js, Fastify, Hono, REST APIs, microservices, event pipelines, background jobs, retries, idempotency

Distributed Systems: Consensus, state recovery and rollback, synchronization, Merkle proofs, concurrency, incident response

AI and Security: Agent harnesses, tool calling, MCP, RAG, evaluations, prompt-injection defense, sensitive-data scanning, audit trails

Data: PostgreSQL (schema design, migrations, transactions, row-level security), Redis, MySQL, Oracle, MongoDB

Cloud and Delivery: AWS, Docker, Ansible, GitHub Actions, Jenkins, Prometheus/Grafana, CI/CD

Frontend: React, Next.js, Tailwind CSS

PROJECTS

Ledger | TypeScript, Fastify, PostgreSQL: Double-entry accounting service; PostgreSQL enforces balanced postings, immutable history and balance rules; idempotency and concurrency tests cover duplicate requests and competing withdrawals.

Hookrelay | Go, PostgreSQL: Durable webhook delivery with HMAC signatures, jittered retries, idempotency, dead-letter replay and multi-instance workers using SKIP LOCKED.

Witness | Go: Tamper-evident transparency log with RFC 6962 Merkle proofs, Ed25519 signed checkpoints, crash-safe storage and split-view monitor.

Akibo | TypeScript, Node.js, Next.js, PostgreSQL, Redis: Founder (2026). Chat and voice AI assistant for personal finance on WhatsApp and Telegram; schema-validated agent tools, explicit confirmations, 47 automated money-integrity invariants, PostgreSQL row-level security and OFX/CSV/PDF/photo statement import with reconciliation.

EDUCATION

B.Eng., Computer Engineering | Pontifícia Universidade Católica de Goiás | 2012 - 2016

Software Engineering Bootcamp (GoStack) | Rocketseat | 2018 - 2019

PUBLICATIONS

Goehausen, R. & Sousa, M. V. G. (2026). Gate AI: LLM Security Benchmark - Evaluation Methodology & Results. Constellation Network. constellationnetwork.io/papers/gate-ai-prompt-injection-benchmark.pdf

LANGUAGES

English - Full professional | Portuguese - Native