Joao Vitor Barros da Silva

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Education

The Pennsylvania State University — University Park, PA
B.S. in Computer Science, Minor in Entrepreneurship and Innovation — *Graduated Aug 2026*

- **Coursework:** Data Structures & Algorithms, Operating Systems, Databases, Machine Learning, Deep Learning

Experience

Software Development Intern — Oct 2025 - Jul 2026
Penn State University Libraries (github.com/psu-libraries) — *State College, PA*

- Merged 10 pull requests to public psu-libraries repositories, shipping production Ruby on Rails features for 40,000+ users through peer code review, RSpec, and CI in a Scrum team.
- Built a Google Scholar integration (ScraperAPI discovery; DOI and trigram title matching gated on PSU affiliation and email domain; 120-day refresh) run across 11,000+ faculty, auto-matching 40% and cutting scrape volume 34%.
- Built a committee REST API with OpenAPI/Swagger docs, consumed by a four-endpoint importer with per-endpoint failure isolation and idempotent upserts, cutting manual departmental processing 60%.
- Built a Python (Pandas) validation pipeline: 17.7K faculty records to 9.8K verified, cutting manual processing over 90%.
- Helped design an AI-assisted PDF accessibility pipeline (Sidekiq, AWS S3, Adobe PDF Services) for a 3M+ upload platform.
- Led the 2 other interns in our cohort: scoped manager requests into tickets, assigned work, ran standups, and reported progress.

Research Lead (First Author) — Feb 2025 - Present
Blockchain Data Intelligence Lab, Penn State — *State College, PA*

- Led QLink (arXiv:2512.18488) as first author, coordinating 2 faculty and 1 student: a quantum-safe cross-chain bridge (PQC, QKD, HSMs); ICDS 2025 presenter, ranked top 5 quantum projects.
- Ran four Python simulation studies: QKD supplied 62-707x validator key demand over 5-50 km fiber, and an ablation showed 200x lower modeled key-compromise risk than classical bridges at under 1 s overhead per transfer.

Innovation and Operations Intern — May 2023 - Jul 2024
Happy Valley LaunchBox, Penn State Startup Accelerator — *State College, PA*

- Integrated HubSpot CRM with a reporting UI for 40+ startups and built AI email automation in Power Automate.

Projects

Clareia, Brazil Congress Transparency | *TypeScript, Go, PostgreSQL, Cloudflare Workers* — Nov 2026 - Present

- Launched a live public site with 500+ users covering all 592 deputies who served in 2025: 226K expense records (R$256M), 22.7K bills, and 473K roll-call votes, each traceable to its official source.
- Built a dual-capture ingestion pipeline that reconciles the open-data API against the annual expense file; a second implementation recomputes every total before release, holding about 180 deputy-months for review instead of showing R$0.
- Cut first load from 174 MB to 6.4 MB (613 to 28 requests) by precomputing aggregates, made ranking re-sorts 9x faster (1.2 s to 0.13 s), and gated every deploy on a PII scan and Playwright checks.
- Built a read-only Go and PostgreSQL REST API (OpenAPI 3.1); k6 load tests exposed an endpoint re-aggregating 123K rows per request, and pre-aggregating at load time cut its p95 ~190 ms to ~15 ms and raised zero-drop throughput 168 to 850+ req/s.
- Built a multi-agent factory that takes a GitHub issue to a merged pull request: a local model triages risk; Claude Sonnet writes the spec; Haiku, Codex, Gemini, and local models build; a different vendor's model reviews; Opus and Fable audit security-critical changes, which wait for my approval. 17 PRs merged in its first 3 days.

kaizen-loop, Self-Improvement Loop for Coding Agents | *Python, SQLite, Claude Code plugins* — Nov 2026 - Present

- Built an open-source Claude Code plugin that records every coding-agent session and reports where tokens are wasted and which mistakes keep repeating, so the agent's skills are fixed from evidence; 571 tests.
- Scores each task 0-10 from tests, retries, cost, and a blind LLM judge that never sees the model or repo; redacts secrets before disk.

New Home Imoveis, Client Platform | *React, Supabase, Node.js* — Jun 2026 - Present

- Delivered a real-estate listing platform for a paying client in Rio de Janeiro: filtered search, WhatsApp lead capture persisted to Supabase before hand-off, and an admin panel secured with Row Level Security and TOTP two-factor auth.

Cognitra, AI Learning Platform | *Next.js, Firebase, OpenAI API, LangChain, AssemblyAI* — Mar 2026 - Aug 2026

- Shipped a live LLM study tool: AssemblyAI transcription plus LangChain/OpenAI chains into summaries, flashcards, and quizzes.

Technical Skills

Languages: Python, TypeScript, JavaScript, Ruby, SQL, Go
Frameworks & Data: Ruby on Rails, Node.js, React, Next.js, REST APIs, PostgreSQL, SQLite, Supabase, Firebase, Pandas, OpenAPI
Cloud & Tools: Cloudflare Workers and R2, AWS S3, Docker, Linux, GitHub Actions, CircleCI, Playwright, RSpec, Git
AI: OpenAI API, LangChain, Claude Code, Codex, Gemini, Ollama
Certifications: IBM AI Agents Using RAG & LangChain; IBM Deep Learning & Neural Networks (2025)