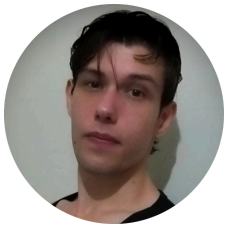

Vinicius Santana

Software Engineer | Python Backend Engineer

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SUMMARY

Python Backend Engineer with production experience building data-intensive APIs, validation services, and automation for municipal public health systems. Works with FastAPI, SQLAlchemy, PostgreSQL, multi-tenant authorization, automated testing, and monitored Linux services. Delivered workflows that validate 21,000+ records monthly, kept outpatient and inpatient claim denial rates below 1% for 8 consecutive submission cycles, down from 12%+, and reduced a municipality-wide workforce reconciliation cycle from 240+ person-hours to about 4.

TECHNICAL SKILLS

Languages: Python, SQL, TypeScript, Bash

Backend & APIs: FastAPI, Pydantic, SQLAlchemy, Alembic, REST/OpenAPI, typed contracts, repository/adapter architecture

Systems & Integration: Authentication and authorization, multi-tenant systems, PostgreSQL RLS, JWT/Cognito, idempotency, background workers, event-driven workflows, SQS, Redis, MQTT

Data & Storage: PostgreSQL, Firebird, DynamoDB, InfluxDB, Parquet, MinIO/S3

Testing & Quality: Pytest, pytest-asyncio, Hypothesis, Testcontainers, Ruff, Pyright, property-based and integration testing

Version Control & CI/CD: Git, GitHub, Jenkins, CI/CD, automated quality gates

Platform & Observability: Docker, Linux, Proxmox KVM/LXC, Ceph, Nginx, AWS (Cognito, DynamoDB, SQS), Prometheus, Grafana

PROFESSIONAL EXPERIENCE

Municipality of Presidente Epitácio - Presidente Epitácio, SP, Brazil | Nov 2021 - Present

Health Informatics, Data & Python Automation | Administrative Clerk (official civil-service title) | Oct 2023 - Present

- Built and operated internal FastAPI/PostgreSQL validation services, REST integrations, deterministic rules, and exception reports for municipal submission and reconciliation, processing 21,000+ monthly records across 13 directly administered and 4 partner-operated facilities.
- Kept outpatient and inpatient claim denial rates below 1% for 8 consecutive submission cycles, down from 12%+, using Python/SQL reconciliation across CNES, SIA/SIH, SIHA/DATASUS, Firebird, and flat files.
- Reduced municipality-wide CNES workforce reconciliation from 240+ person-hours to about 4 per cycle using Python extraction, Parquet processing, provenance controls, and centralized APIs.
- Helped eliminate the SIA/SIH submission backlog within 3 months by profiling 4 legacy systems and correcting 10,000+ records.
- Worked with healthcare professionals, billing teams, and municipal managers to define rule behavior and exceptions, producing 11 reusable CNES audit rules and handoff documentation.
- Automated reproducible service deployment and configuration across LXC/VM environments using Ansible and Jenkins pipelines, with pre-deployment validation, backup checkpoints, health checks, and documented rollback procedures.
- Executed a production rollback after a failed e-SUS PEC update, restoring the application and a 9 GB PostgreSQL database from validated backup checkpoints and returning the service to operation within one hour.

IT Infrastructure & Systems Support | Internship | Nov 2021 - Oct 2023

- Operated 9 municipal Linux/Proxmox compute nodes, 2 backup nodes, 23 LXCs, and 7 VMs, including the production e-SUS PEC environment for 293 active professionals; reverse-proxy logs recorded about 2.4M aggregate HTTP requests monthly.
- Maintained 7-day rotating snapshots, incremental database backups, and weekly full backups for e-SUS PEC and billing hosts; used Ceph replication for high-availability services and resolved replication failures.
- Operated LXC-hosted services for identity, secrets, object storage, observability, automation, CI, NAS, IT service management, and inventory, plus an internal API for workstation data collected by endpoint agents.

Irmãos Santana - Panorama, SP, Brazil | Feb 2021 - Jan 2026

Business Analyst & Operations Manager | Family Business, Part-Time

- Increased profitability by 26% and reduced feed waste by 11% by redesigning cost controls, pricing models, purchasing, inventory, and production workflows for a 20-ton/month aquaculture operation.
- Developed Python decision-support scripts, spreadsheet automation, ERP workflows, and MQTT monitoring prototypes for production KPIs, inventory, water quality, and operating costs.

SELECTED PROJECTS

Limnopulse | 2026 - Present | Python, FastAPI, Pydantic, DynamoDB, InfluxDB, Redis, MQTT, AWS | github.com/VINICIUS/limnopulse

Portfolio platform under active development and testing; not yet in production.

- Built tenant-authorized FastAPI endpoints for telemetry, metrics, alert rules, and incident workflows with role and resource-ownership checks.
- Implemented optimistic concurrency, idempotent alert-rule replacement, and a durable outbox for incident opening and recovery to preserve consistent state across retries; integrated JWT/Cognito, Redis, InfluxDB, and automated tests.

CnesData | 2024 - Present | Python, TypeScript, React, FastAPI, Pydantic, SQLAlchemy, PostgreSQL, Alembic, Parquet, MinIO/S3 | github.com/VINICIUS/CnesData

Public repository: research and portfolio implementation under development for a future external pilot. Separate private municipal validation and reconciliation workflows run in production.

- Designed tenant-aware FastAPI ingestion with PostgreSQL RLS, typed contracts, migrations, and adapter boundaries that isolate Firebird/DBF sources from Parquet manifests and MinIO/S3 storage.
- Built a React/TypeScript dashboard for municipal health managers, consuming tenant-scoped FastAPI APIs secured with OIDC and using generated OpenAPI types for agent status, access requests, and 12-month operational KPIs.
- Built staged diagnostics across isolated Windows/Linux VMs using process dumps, network captures, and HTTP/TLS inspection to isolate process, service, and transport failures.
- Enforced CI quality gates with Pytest, Hypothesis, Testcontainers, Ruff, Pyright, branch coverage, integration and negative tests, benchmarks, and memory checks.

e-SUS PEC Bootstrap | Jun 2026 - Present | Python, uv, Docker, MinIO/S3, WAL-G, Prometheus, Grafana | github.com/VINICIUS/esus-pec-bootstrap

Used to provision and validate the municipal production e-SUS PEC environment described above.

- Standardized e-SUS PEC provisioning, first-run configuration, TLS, Gov.br OAuth, CNES/PBF imports, backup, restore, monitoring, and operational validation across reproducible LXC/VM deployments.
- Documented deployment and recovery procedures, kept secrets outside version control, and validated backup and restore workflows in production.

EDUCATION

B.Sc. in Computer Science - Universidade Paulista (UNIP) | Graduated Jul 2026 | GPA: 8.85 / 10.0

Information Technology - Systems Development Track - IFSP | Completed Dec 2021 | GPA: 8.87 / 10.0

LANGUAGES

Portuguese: Native | English: B2