

Francisco de Assis de Souza Rodrigues

Computer Scientist · Systems Analyst · Software Engineer Focus: **Artificial Intelligence, LLMs, Natural Language Processing, and backend engineering**

PhD candidate in Computer Science at [CIn / UFPE](#), MSc in Computer Science at CIn/UFPE, MBA in Higher Education Teaching at [IDJ](#). Undergraduate background in Industrial Automation (incomplete) at [IFCE](#) and Systems Analysis and Development at [UniLeão](#). Formerly professor at UniFAP and Coordinator of the Information Technology Extension Center — [NExTI](#). Currently technology advisor at [NeuroEspectro](#), Software Engineer and Computer Scientist at [Octor](#), and entrepreneur.

My interests span many areas of computing. I am especially passionate about Machine Learning, Deep Learning, Learning Analytics, Natural Language Processing, Text Mining, Data Analysis, Information Extraction, Search Engines, Data Deduplication, Assistive Technology, Image Processing, Computer Vision, Robotics, Automation, and the Internet of Things (IoT) — as well as LLMs, ASR, OCR, tool-using agents, and backend engineering with microservices.

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Skills and technologies

Artificial Intelligence & NLP

LLMs (serving with [vLLM](#), prompts, tool agents) · Transformers · NLI / typed decisions (MiniLM, [Laya](#) / System One) · ASR ([Whisper](#) / [whisper.cpp](#)) · OCR (Tesseract, RapidOCR/Paddle) · RAG / document chat · Text mining · Information extraction · Data deduplication · Learning Analytics · Machine Learning · Deep Learning · Computer vision · Image processing

Software engineering & backend

Python · Rust (Actix) · FastAPI · PHP · Node.js · Java · JavaScript · REST APIs · Microservices · Queues (Redis) · Webhooks · Integrations (WhatsApp, CRM, payments) · SQL (MySQL, PostgreSQL, SQLite) · MongoDB · Docker · CI/CD · Linux · Windows · AWS (Lambda, SQS, S3, CloudWatch) · Azure (VM, storage) · ELK · Airflow · Sentry · Swagger/OpenAPI · unit and integration tests · Arduino · LEGO · C/C++ · WordPress · HTML · CSS

Domains

Digital health (EHR, scheduling, telemedicine, ICD/TUSS) · TechFin / credit · Assistive technology · Education and educational robotics · Automation and IoT

Professional experience

Octor — Co-founder, Computer Scientist & Software Engineer

[octor.com.br](#) (formerly [qHoras](#)) · present

I am currently a software engineer and computer scientist at [Octor](#), a startup focused on software for managing clinics, medical practices, and healthcare professionals. Octor's mission is to deliver technology that streamlines workflows, improves patient-care efficiency, and simplifies practice management.

I work across the full development cycle — from conception and architecture to delivery and maintenance. I also integrate external APIs, optimize platform performance, and build data-analysis algorithms that provide detailed insights to users. I apply machine learning and data science techniques for recommendations and informed decisions in patient care.

AI / LLM / NLP contributions (in production)

- Clinical LLM platform (**Sereia**): Rust API + Redis queues + GPU workers (Whisper speech-to-text; vLLM instruct model for chat/agent) with clinical tools (ICD, TUSS, ANVISA formulary, knowledge)

- Decoupled **transcription** (ASR) service with async jobs and Whisper on GPU
- CPU **typed-decision** engine (platform-decide): intent classification, scoring, and NLI (yes/no with confidence) for SDR, chat, CRM, tickets, and clinical-risk gating — no free-form generation
- Integration and ops for **Laya** (System One / multilingual typed decisions) in internal flows (e.g. ticket priority)
- WhatsApp intake orchestration (**SDR AI**): classify with decide/NLI, reply with controlled text, sync CRM — no clinical hallucination from generative LLMs
- **Text extraction** (PDF/DOCX/image) with cascaded OCR for CRM and migrations
- Document chat (PDF) and model experimentation for product

Backend & product

- Microservices and APIs for scheduling, EHR, billing, inventory, confirmations, and automations
- Telemedicine, intelligent EHR, and process automation
- WhatsApp, CRM, and external integrations; API-key auth; OpenAPI documentation
- Self-hosted deploy and operations (Docker, bare metal, GPU workers, internal VPN)

Skills: Software Engineering, Backend Development, Microservices, APIs, Data Analysis, Machine Learning, LLMs, NLP/NLI, ASR, OCR, Python, Rust, FastAPI/Actix, Redis, vLLM, Whisper, Transformers, Laya, PHP, MySQL, SQLite, Docker, Linux, OpenAPI, PaaS

NeuroEspectro Clinic — Technology & Strategy Advisor

neuroespectro.com.br · present

I am currently a technology and strategy advisor at [NeuroEspectro](https://neuroespectro.com.br), a clinic specialized in cognitive disorders and developmental conditions. My work includes consulting on technology solutions and defining strategies to optimize patient care, modernize digital infrastructure, and integrate new tools that improve the experience of patients and clinical staff.

With a focus on innovation, I work closely with the NeuroEspectro team to implement telemedicine, intelligent electronic health records, and process automation for greater treatment efficiency. I also help define growth and expansion strategies, using data analysis and technology to promote more inclusive and personalized care.

Skills: Health Technology, Digital Strategy, Process Automation, Telemedicine, Electronic Health Records, Data Analysis, Technology Consulting

CoWatch — Founder & Software Engineer

2024 – present · cowatch.com.br

I founded [CoWatch](https://cowatch.com.br), an **agritech** platform for farm and herd management (still operating). It helps monitor and optimize livestock production — including feeding and handling of each animal — with remote access from phone or computer.

At CoWatch I owned **all of the software development**, covering farm administration and herd management:

- Financial dashboard, employee management, property control, and remote access
- Milk production, births, reproductive cycle, drying-off, periodic weighing
- Herd events and movements with operational history
- Integrations, analytics, and foundation for monitoring (including IoT/sensors in the product roadmap)

Skills: Software Engineering, Full Stack, agritech, dashboards, APIs, PHP, CodeIgniter, JavaScript, Framework7, Python, FastAPI, MySQL, Arduino, sensors, IoT, Linux

NoVerde / Dotz — Backend Developer (Python)

Jan/2023 – May/2023

On the TechFin team for the credit product at [NoVerde/Dotz](https://noverde.com.br), I focused on the loan payment system. That experience let me work with many technologies and people, and immerse myself in the financial domain. As a Python backend developer, I built new features for existing APIs, wrote unit and integration tests, and migrated a Ruby legacy stack to

newer technologies such as Python, Lambda Cron, Airflow, and ELK monitoring. I also took an active role in day-to-day operational problem-solving. I worked in this role from January 2023 to May 2023.

Skills: Python microservices, PostgreSQL, SQL, Swagger, AWS (Lambda, SQS, CloudWatch, Serverless, S3), Sentry, ELK, Airflow, Ruby, Linux

Realm — Co-founder & Software Engineer

2022 – 2023 · realm.com.br · Instagram [@sou.realm](https://www.instagram.com/sou.realm)

Realm is a technology startup from Juazeiro do Norte (CE) focused on **mobile digital out-of-home (DOOH) advertising**. The main product, **BagLed**, puts LED ads on bags/backpacks worn by motorcycle couriers: the advertiser's brand moves through the city as riders complete their routes — “your brand in motion.”

As co-founder and software engineer, I built and maintained the digital layer behind bag operations and campaigns:

- Company website and institutional pages
- **Bag monitoring** system (status, field operation, and hardware maintenance)
- **Courier tracking** on route, for campaign coverage and circulation
- **Bag assembly and maintenance** workflows (operational control of the physical asset)
- Software for **advertising KPIs and metrics**, measuring campaign performance to support sales and media decisions

The work spanned product, operations, and engineering — from the website to field software and DOOH campaign dashboards.

Skills: Software Engineering, Full Stack, APIs, tracking/geolocation, device monitoring, dashboards and metrics, PHP, JavaScript, Python, MySQL, Linux, DOOH / mobile digital advertising

NeuralMind — AI / NLP Research & Development

May/2022 – Nov/2022 · FACEPE grant

At NeuralMind, a startup focused on AI research and innovation, I worked on a high-impact project. We developed and maintained an advanced search system based on state-of-the-art natural language processing models. The system, NeuralSearchX, can search databases in seconds with precise results and answer highly complex questions.

From May 2022 to November 2022, I was involved in FACEPE-funded research as well as continuous development and improvement of NeuralSearchX. It was a rich opportunity to apply my AI knowledge and contribute to effective market solutions.

Skills: Natural Language Processing, Machine Learning, Transformers, Text Extractor, Data deduplication, OpenAI GPT-3, Python, NLP, FastAPI, AWS (S3), Azure (VM, Bucket), Docker, SQLAlchemy, Textract, Linux

Zafie — Co-founder & Software Engineer

2021 – 2022 · zafie.com.br

I co-founded Zafie, a **digital menu and online ordering** platform for food businesses (restaurants, cafés, and similar) and retail.

I built the platform so venues could digitize their menus and customers could place orders easily on their phones — with a focus on business operations and customer experience:

- Digital menu and customer ordering flow
- Table features (e.g. QR Code), integrations (WhatsApp, POS), and operational support
- Promotions, coupons, and cashback for engagement and retention
- Dashboards and tools for food-service teams to manage orders

This came before Realm, in the same product track for local businesses.

Skills: Software Engineering, web platforms, digital menus, food tech, APIs and integrations, PHP, CodeIgniter, JavaScript, Bootstrap, HTML, CSS, MySQL, AJAX, dashboards

Cronos Cariri — Software Developer

2019 – 2020

At [Cronos Cariri](#), I worked on software development. In that role I gained experience with [Impinj](#) RFID readers, with a focus on performance. One project I built was a TAG collector used in street races — including motorbike and other sports — to record runners' times.

During 2019 and 2020 I applied my skills to improve race timing monitoring and control. With the Impinj RFID reader and the TAG collector I built, organizers and athletes got more precise and efficient timing.

Skills: Python, Java, MongoDB, WebSocket, RFID tags, Angular, JavaScript, Node.js, Linux, Windows

CreateLab — Founder & Educational Software Engineer

2019

I founded **CreateLab**, a technology-education startup for children, teens, and schools: educational robotics, teaching materials, and teacher training.

At CreateLab I combined educational product and software engineering:

- Development of **didactic materials** for students (robotics/programming content and practices)
- **Teacher training** to apply the method and kits in the classroom
- Development of **educational robotics kits** (pedagogical hardware/software)
- **Online platform** with school and student portals for digital didactic materials
- Digital distribution to schools, including kit purchase flows

Skills: Technology education, educational robotics, didactic materials, teacher training, web platforms (school/student portals), Arduino, LEGO, C/C++, PHP, JavaScript, Node.js, Laravel, Angular, WordPress, HTML, CSS, Linux, Windows

Education

PhD in Computer Science — UFPE / CIn

Currently (started 2024) a PhD candidate in Computer Science at UFPE CIn, with emphasis on Artificial Intelligence and a topic on Learning Analytics applied to Assistive Technology, supported by a CAPES scholarship. I have the honor of being advised by [PhD Robson Fidalgo](#), PhD in Computer Science.

MSc in Computer Science — UFPE / CIn

From 2017 to 2019 I completed my Master's in Computer Science with emphasis on Artificial Intelligence at the Federal University of Pernambuco ([UFPE](#)), with a CAPES scholarship. During that period I was a student at the Informatics Center ([CIn](#)).

My thesis, *DeepNLPF: a framework to integrate linguistic analysis and semantic annotation of text documents*, is available in the [UFPE repository](#). Advised by PhD Robson Fidalgo; co-advised by [PhD Rinaldo Lima](#).

During the Master's I deepened my knowledge in Artificial Intelligence, focusing on linguistic analysis and semantic annotation of text documents. Building the [DeepNLPF framework](#) was a significant contribution to integrating those two aspects. The experience gave me a solid foundation in AI research and development and led to an [international publication at LREC 2020](#).

MBA in Higher Education Teaching — Instituto Dom José (IDJ)

From 2015 to 2016 I completed an MBA in Higher Education Teaching at [Instituto Dom José \(IDJ\)](#). My capstone was titled *Technologies as Assessment Tools*, advised by MSc. Bia Barata.

The MBA provided a solid base of knowledge and skills for higher-education teaching practice. I explored technologies as assessment tools and their role in engaging, innovative learning environments. The program strengthened my teaching capacity, instructional strategies, and pedagogically sound use of technology.

Systems Analysis and Development — UniLeão

From 2011 to 2014 I completed a bachelor's degree in Systems Analysis and Development at Centro Universitário Leão Sampaio (UniLeão). My capstone was [DAVI: Assistive Device for the Visually Impaired](#), advised by [PhD Thiago Bessa Pontes](#) and co-advised by MSc. Renata Kalina.

During the degree I built solid skills in systems analysis and development across many technologies and methodologies. The DAVI project was a milestone: applying technical knowledge to create an assistive device for visually impaired people and awakening my interest in technology as a tool for social inclusion.

Industrial Automation — IFCE (Juazeiro do Norte)

From 2016 to 2017 I studied Industrial Automation Technology at the Federal Institute of Ceará (IFCE) — Juazeiro do Norte campus (incomplete). I was a PIBIC scientific initiation scholarship holder, advised by [MSc. Alan Kelvin](#).

During the course I gained knowledge in automation, industrial process control, and related technologies. IFCE provided a practical and theoretical learning environment that strengthened my foundation in industrial automation.

Teaching experience

UniFAP — Lecturer (ADS and IS) and NExTI Coordinator

At [UniFAP](#) I taught in the **Systems Analysis and Development (ADS)** and **Information Systems (IS)** undergraduate programs, and served as Coordinator of the Information Technology Extension Center — [NExTI](#).

Courses I taught in ADS and Information Systems included:

- Biohacking, Deep Web & Cryptography (ADS)
- Data Science (distance learning / EAD)
- Mobile Application Development (IS)
- Software Engineering
- Internship supervision (Estágio)
- Computer Organization and Architecture (IS)
- Capstone — IT Governance
- Capstone — Web Project and Development
- Special Topics in Information Systems (IS)

Beyond teaching, I sat on dozens of undergraduate thesis (TCC) evaluation boards, assessed student projects, and helped organize academic events.

At [NExTI](#) I led IT extension: real projects with students for regional companies and organizations, hands-on workshops (Scrum, Docker, logging, OWASP), and the applied lab [NExTI AI](#) (2025), focused on AI solutions with market and social impact. The through-line was learning by shipping — classroom, extension, and software delivery together.

Skills: Higher-education teaching (ADS / IS), extension coordination, thesis boards, project evaluation, event organization, capstone and internship mentoring, software engineering, data science, mobile, computer architecture, IT governance, cryptography / security

UFCA (UAB) — Lecturer

I currently teach at the [Federal University of Cariri](#) (UFCA), in the Open University of Brazil (UAB) program, in distance education for the [Multimedia Production](#) technology degree, in the Audiovisual Design course.

I teach theoretical and practical classes, develop and update the syllabus aligned with technological innovation and market needs, and design assessments that promote both practical and theoretical learning.

I participate in academic meetings and collaborate with course coordination on continuous improvement. I also advise and follow student projects, supporting the development of their skills. Period: 2024.

Colégio Nossa Senhora de Fátima — Robotics teacher

I worked as an educational robotics teacher at [Colégio Nossa Senhora de Fátima](#), in Barbalha, CE. My main focus was teaching robotics to Elementary and High School students. I also trained teams for competitions such as the [Brazilian Robotics Olympiad - OBR](#), the [Brazilian Satellite Olympiad - OBSat](#), the [Youth Robotics Tournament - TJR](#), the [Brazilian Robotics Tournament - TBR](#), and others.

Over those years we earned awards and recognition with my students. One of the greatest lessons was not only teaching, but learning to deal with defeat: after long nights of preparation, I learned not to give up and to pass that resilience to students so they would stay curious. Period: 2019–2022.

Skills: Teacher, coach, Arduino, LEGO, C/C++, Python, Linux, Windows

Colégio Objetivo — Computing, programming & robotics teacher

I worked as a teacher of computing, programming, and educational robotics at [Colégio Objetivo](#), in Juazeiro do Norte, CE. I taught Early Childhood, Elementary, and High School students on educational computing, logical reasoning, and programming logic.

Beyond teaching, I helped organize robotics tournaments, advise science-fair projects, and train students for programming contests such as [OCI](#) (Ceará Informatics Olympiad), [OBI](#) (Brazilian Informatics Olympiad), and the [Robots](#) robotics tournament.

From 2016 to 2017 and 2019 to 2021 I contributed to students' development with skills needed for a constantly evolving digital world.

Skills: Teacher, coach, Arduino, LEGO, C/C++, Python, Java, JavaScript, Node.js, PHP, WordPress, HTML, CSS, Linux, Windows

UniLeão — Teaching assistant, Intro to Algorithms

During my undergraduate studies at UniLeão I was a teaching assistant for Introduction to Algorithms. I actively supported classroom work — teaching sessions, reviewing content, answering questions, and solving exercises.

Through the assistantship I provided individualized support so students could grasp fundamental concepts and improve algorithm skills. I collaborated with the professor and helped create an enriching learning environment.

I was supervised by MSc. Aldeivo Thiago and MSc. Herlon Cortez, whose guidance was essential. From 2013 to 2014 I contributed significantly to student success in the course.

The experience strengthened my teaching, communication, and leadership skills while supporting students on their academic path.

Skills: Teaching assistance, Algorithms, Java, C/C++

Entrepreneurship

As an entrepreneur, I am proud to be founder and co-founder of several innovative startups, including [Realm](#), [Octor](#), [Zafie](#), [ImmoNex](#), [Yaakov](#), [CoWatch](#), and [CreateLab](#).

Details: [Startups](#)

Other links

- [Courses & certificates](#)
- [Projects](#)
- [Publications](#)
- [Honors & awards](#)
- [Metodologia em Computação](#)
- [Clube dos Geeks](#)

The real development of the person is not in what he demonstrates to know, but in the mistakes he fails to make. —
Allan Kelvin Sales, 2015