Carlos Henrique Caloete Pena

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SUMMARY

R&D Data Scientist Specialist with over 6 years of experience and a Master's in Computer Science (UFPE), focused on delivering AI solutions that drive real business impact. I bring a solid foundation in **AI, computer vision, machine and deep learning**, with hands-on experience developing and deploying custom models at scale.
Beyond the technical side, I'm skilled at **leading** cross-functional teams and managing projects in **agile** environments aligning **AI** strategies with business goals and accelerating innovation. I work closely with stakeholders to turn complex challenges into production-ready solutions, combining deep technical knowledge with strong communication and leadership.

EDUCATION

Universidade Federal de Pernambuco (UFPE) — Graduated in October 2022
Master of Science in Computer Science (Segmentation of medical images - Advisor: Tsang Ing Ren) — *GPA 4.0/4.0*

- Publication on IEEE - IJCNN: An Ensemble Learning Method for Segmentation Fusion

Universidade Federal de Pernambuco (UFPE) — Graduated in December 2019
Bachelor of Science in Computer Engineering — *GPA 8.67/10*

ELS Language Centers - Vancouver, Canada — Graduated in June 2014
Intermediate level - General English Program — *GPA 3.1/4.0*

WORK EXPERIENCE

Ferreira Costa (Top 5 Retail/E-commerce in Brazil) — Recife, Pernambuco, Brazil
AI Architect (April 2025 - present), AI Specialist (jun 2024 -April 2025), and Senior Data Scientist (Jul 2021 - May 2024) — July 2021 - Present

- **Lead** multiple agile squads in **R&D** of **AI-driven** solutions, including computer vision and generative AI. Drive Scrum ceremonies, backlog refinement, and strategic alignment with Product Owners to ensure delivery is tightly connected to real business needs.
- **Spearhead communication** between developers and stakeholders, transforming high-level objectives into technical tasks that solve customer pain points and support measurable outcomes.
- **Architected** a high-performance e-commerce **catalog** platform using **MongoDB** and **RabbitMQ**, enabling scalable ingestion and low-latency retrieval of product data.
- **Developed image processing pipeline** combining generative AI, deep learning, and traditional computer vision techniques. Utilized AWS SageMaker, integrating Python-OpenCV for automated product media enhancement and quality control.
- **Engineered** a 24/7 **Shipping System** capable of handling over 13K concurrent users during peak events like Black Friday. Ensured high availability with integrated observability tools and a tech stack including Oracle, PostgreSQL, Redis, and AWS (ECR, EKS, S3).
- **Architected** and maintained high-performance **data structures** (**Materialized Views, scheduled Jobs, Redis caching layers**), and **workflow orchestration** with Dagster
- **Oversaw** application **deployment pipelines** using GitLab CI/CD, AWS and Rancher, ensuring reliable version control and efficient CI/CD practices.
- **Built** a custom **product search engine** using ElasticSearch, significantly improving conversion rates by integrating insights from Google Analytics.
- **Honored** as **IT Professional of the Year** by FerreiraCosta/FCxLabs (2023)

NCR Tech Corporation (old name: OKI Brasil) — Recife, Pernambuco, Brazil
*Graduate Research Fellow (*Feb 2020 - June 2021*), and Intern (*Jun 2018 - Feb 2020*).* — June 2018 - June 2021

- **Researched and developed** computer vision and deep learning solutions.
- **Create and present weekly progress reports** to the client (audience: administrative and technical from NCR - São Paulo). Led discussions on emerging AI techniques, defining next steps based on new requirements, feature updates, and system limitations.

ACADEMIC EXPERIENCE

Centro de Informática (CIn) - Universidade Federal de Pernambuco (UFPE) — Recife, Pernambuco, Brazil
*Scientific Research Scholarship Program (*object detection and image segmentation with deep learning*)* — Jan 2017 - Jan 2019
*Teaching Assistant (*Introduction to Programming and Digital Systems) — Jan 2015 - Dec 2017

MAJOR PROJECTS

RobôCIn (UFPE Research Group) — Nov 2015 – Jul 2021
Co-founder of a research team with 80+ members developing autonomous robots.

- Led teams in robot soccer AI research, applying Deep Learning and Reinforcement Learning, with publication on IEEE-LARS
- Developed vision and control systems using OpenCV, QT, and ROS. For @Home (human-size) and IEEE VSSS (robot car)

SKILLS

PROGRAMMING LANGUAGES

Major: Python, PL-SQL, SQL, C/C++

SKILLS

Python, Computer Vision, Deep Learning, Machine Learning, Pytorch, AWS (EKS, SageMaker, S3), Git, GitLab CI/CD, Oracle, PostgreSQL, ElasticSearch, MongoDB, Redis, RabbitMQ, Docker, Agile, Leadership, Project Management, OpenCV, Generative AI, Dagster, Kubernetes, CI/CD, Data Engineering, Pandas, Polars, FastAPI

AWARDS

Honored as IT Professional of the Year by FerreiraCosta/FCxLabs (2023)
1st Place Team at Microsoft College Bot-ando Competition UFPE (2019)
Achieved top rankings in Latin American IEEE Very Small Size Soccer: 5th (2017), 4th (2020).
3rd Place Team at Microsoft College Code Competition UFPE (2018)
Top 10 project at National DragonBoard IOT embedded competition among 350 teams (2017)
Honorable Mention at Sigfox Embedded system - WND IoT Challenge (2017)

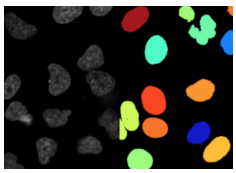
CERTIFICATIONS

LlamaIndex: creating a chatbot with the RAG technique (Alura 2024), Rust (Alura 2023), Kafka (Alura 2023), Agile Management Practices SC-AMP (Agile Institute Brazil 2022), Scrum (Alura 2022), Kanban Foundation KIKF (2020), Deep Learning with Pytorch (Udemy 2018), Deep Learning: GANs and Variational Autoencoders (Udemy 2017), 3D Printing with Fusion 360 (Udemy, 2017), Android (CITi, 2016), Logic: Language and Information (Melbourne, 2015).

LANGUAGES

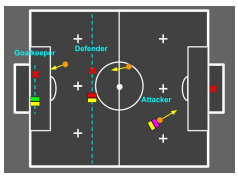
Portuguese (Native)
English (Full professional proficiency)

PAPERS



An Ensemble Learning Method for Segmentation Fusion
2022 IEEE - IJCNN, Padua-Italy, DOI: 10.1109/IJCNN55064.2022.9892717

A learning ensemble strategy that aggregates many independent candidate segmentations of the same image to produce a single consensus segmentation.
Keywords: Image Segmentation Fusion; Image Segmentation; Deep Neural Networks; Computer Vision.



An analysis of Reinforcement Learning applied to Coach task in IEEE Very Small Size Soccer
2020 IEEE - LARS, Natal-Brazil, DOI: 10.1109/IJCNN55064.2022.9892717

An end-to-end approach for the coaching task based on Reinforcement Learning, evaluated in the simulated environment of the IEEE Very Small Size Soccer (VSSS) competition.
Keywords: Reinforcement Learning; Neural Networks, Simulated Robots.

CONTACT

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