Carlos Henrique Caloete Pena

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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*

- *Automatic panoptic segmentation of microscopic cells for cell counting and shape analysis.*
- 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 teams in the **research and development of AI-driven, computer vision, and GenAI solutions**. Oversee Scrum activities, including backlog refinement, code reviews, and strategic alignment with Product Owners. Play a key role in facilitating dialogue between developers and clients/POs, ensuring clear communication and focusing on generating tasks that directly address pain points and business needs.
- **Designed and implemented** a Transport Management System (TMS-**Shipping**) capable of supporting 13K+ simultaneous users during peak events (e.g., Black Friday). The system operates **24/7, ensuring high availability and reliability**. Integrated observability tools for real-time monitoring and performance optimization. Stack includes Oracle, PostgreSQL, Redis, and AWS services (ECR, EKS, S3).
- Created a custom **product search engine** with ElasticSearch, optimizing the e-commerce conversion rate using Google Analytics (GA) feedback.
- Named IT Professional of the year by FerreiraCosta/FCxLabs in 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 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 – UFPE) — Recife, Pernambuco, Brazil
Scientific Research Scholarship Program — Jan 2017 - Jan 2019

- Research on object detection and image segmentation with deep learning.

Universidade Federal de Pernambuco (UFPE) — Recife, Pernambuco, Brazil
*Teaching Assistant (*Introduction to Programming and Digital Systems — Jan 2015 - Dec 2017

MAJOR PROJECTS

RobôCIn — 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.
  - Publication on IEEE: An Analysis of Reinforcement Learning Applied to Coach Task in IEEE Very Small Size Soccer
- Developed vision and control systems using OpenCV, QT, and ROS.
- Developed a software system with ROS to control a human-size domestic robot for the @Home category on RoboCup.
- Presented multiple workshops (computer vision / 3D modeling and printing / robotics simulator).

SKILLS

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

TECHNOLOGIES
Pytorch, OpenCV, Pandas, Polars, FastAPI, Git, Docker, ElasticSearch, AWS/Boto3, Unix/Bash, 3D printing.

OTHER AWARDS

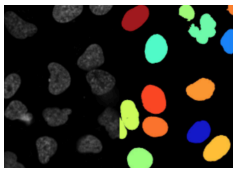
1st Place Team at Microsoft College Bot-ando Competition UFPE (2019)
Achieved top rankings in Latin American IEEE Very Small Size Soccer: 5th (2017), 4th (2020).
3rd Place Team at Microsoft College Code Competition UFPE (2018)
Top 10 project at National DragonBoard IOT embedded competition among 350 teams (2017)

ONLINE COURSES

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).

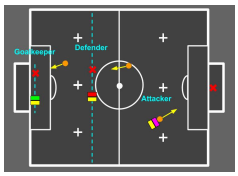
Honorable Mention at Sigfox Embedded system - WND IoT Challenge (2017)

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.