Sarah Almeida Carneiro

Computer Scientist |Research Scientist |Research Engineer
Dual citizen: U.S. and Brazil *Resides in : France*
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Skills

Programming Languages: Python, Java, MATLAB, C++, C
Machine Learning/Frameworks: Pytorch, TensorFlow, Scikit-learn
Deep Learning: Neural networks, convolutional neural networks, graph neural networks, supervised and unsupervised learning, classification, regression, feature engineering
Image Processing: Segmentation, filtering, image restoration
Research Methodologies: Experimental design, data analysis, statistical inference
Problem Solving: Critical thinking, logical reasoning, creative problem-solving
Tools/Libraries: NumPy, Pandas, OpenCV, Matplotlib, Seaborn
Development Environments: Anaconda, Spyder, Visual Studio, Vim, Jupyter Notebook
Version Control: Git
Documentation: LaTeX, Doc

Professional Experience

Prediction Research — 2020 - 2024

PhD fellowship at IFPEN - French company focused on energy, transportation, and the environment. — *France*

- Developed four innovative methods for predicting vehicle speeds by leveraging neural network and deep learning strategies for mobility data reconstruction and prediction, integrating multiple input sources.
- These methods are slated for integration into IFPEN's diverse research endeavors, enhancing their analytical capabilities across multiple fields.

Multimedia Classification Research — 2017 - 2019

Master's fellowship at Semantix - Brazilian company, specializing in Big Data and Data Science — *Brazil*

- Enhanced video analysis capabilities through the development of deep neural network multi-stream ensembles for identifying fighting and falling actions.
- Improved accuracy in video action classification, expanding Semantix's potential for safety-focused AI product applications.

Image Processing Research — 2017

IMScience (PUC MG) scholarship - Image and Video processing Lab — *Brazil*

- Elevated an image inpainting framework with a hierarchical segmentation approach, enabling precise identification of optimal image regions for information retrieval for image filled areas.
- Resulted in winning the university's third place for Best Bachelor in Computer Science Research Award.

HCI Research — 2015

Summer research Intern at Stony Brook University NY — *USA*

- Contributed to the collaborative development of and HCI educational software for teaching alphabet writing to children while interning at Stony Brook University's Multimedia Lab, where I also gained experience in integrating software with hardwares like Kinect and other motion-capturing sensors.

Temporary Research and Teaching Associate — 2021 - 2024

ESIEE - Temporary teaching and research fellow in French higher education — *France*

- **IA for Images -** Taught students the analytical approach to problem-solving in Image Analysis using Deep Learning techniques, emphasizing critical thinking beyond mere code implementation. Achieved a 100% approval rating. Deepened my expertise in the subject matter.
- **IA & Deep learning -** I acquired proficiency in communicating complex deep learning concepts to individuals unfamiliar with the topic, effectively demonstrating the practical application of deep learning techniques through hands-on programming projects. Strengthened my grasp of the topic.
- **3° year Project Orientation -** Initiated and led projects, gaining experience in guiding student groups towards achieving both product and research objectives. Enhanced outcomes through effective supervision and mentoring.
- **Optimization and Introduction to IA -** Guided students in applying analytical approaches to problem-solving, enhancing their understanding of optimization principles and techniques. Broadened my insight into the subject area.

- **Optimization Algorithms -** Enhanced the ability to convey mathematical optimization concepts in a clearer and more comprehensible manner, thereby fostering deeper understanding and engagement among students.
- **Algorithms -** Introduced data structures and complexity augmenting my proficiency in the subject matter.

Teaching assistant

Brazil

- Algorithms and Computer Programming (UNICAMP) - Introduction to programming with Python
- Graph Algorithms (PUC MG) - Introduction to graph algorithms

Education

PhD in Computer Science — Paris, France
Université Gustave Eiffel (UGE) — *2020 - 2024*

Master in Computer Science — Campinas, Brazil
University of Campinas (UNICAMP) — *2018 - 2020*

Publications - Primary Author

- **Clustering Dynamics for Improved Speed Prediction Deriving from Topographical GPS Registrations** – Submitted to: Transactions on Intelligent Transportation Systems (T-ITS), 2023.
- **SWMLP: Shared Weight Multilayer Perceptron for Car Trajectory Speed Prediction using Road Topographical Features** – In: Models & Technologies for Intelligent Transportation Systems (MT-ITS), 2023.
- **Multi-Stream Deep Convolutional Network Using High-Level Features Applied to Fall Detection in Video Sequences** – In: International Conference on Systems, Signals and Image Processing, 2019, Osijek. 26th International Conference on Systems, Signals and Image Processing (IWSSIP), 2019. v. 2019. p. 293-298.
- **Deep Convolutional Multi-Stream Network Detection System Applied to Fall Identification in Video Sequences** – In: 15th International Conference on Machine Learning and Data Mining (MLDM 2019), 2019, New York. 15th International Conference on Machine Learning and Data Mining MLDM 2019, 2019. v. 2019. p. 1-12.
- **Fight Detection in Video Sequences Based on Multi-Stream Convolutional Neural Networks** – In: 32nd Conference on Graphics, Patterns and Images (SIBGRAPI 2019), 2019, Rio de Janeiro. 32nd Conference on Graphics, Patterns and Images (SIBGRAPI 2019), 2019.
- **Inpainting Based on Local Patch Search Supported by Image Segmentation** – In: The 23rd Iberoamerican Congress on Pattern Recognition, 2018, Madrid. v. 2018. p. 1-8.

Other Publications

- **Graph-Based Supervoxel Computation from Iterative Spanning Forest** – JERONIMO, C. et al - In: International Conference on Discrete Geometry and Mathematical Morphology. Springer, Cham, 2021.

Event Participation

Oxford Machine Learning Summer School 2022 - Advanced AI summer school in ML x Health and ML x Finance, offering courses in ML/DL .

Awards and Grants

- **Third place for best undergraduate thesis award** (2017)
- **CAPES undergrad Scholar for the program science without borders (CSF)** (2014–2015): 1 year exchange scholarship program of the Brazilian government - Studied at Stony Brook University NY USA

Languages

Portuguese - Native; English - Fluent; French - Intermediate; Spanish - Beginner