

Juan Ignacio Specht

@ Leniolabs LLC

Data Scientist at Leniolabs

Key Expertise

- Time Series Analysis
- Data Science
- Analytical Skills
- Image Processing

Summary

- At Leniolabs, I had the opportunity to work on the backend for projects involving document analysis and classification, as well as marketing data collection and processing.
- As a member of the AI team at Leniolabs, I am currently coducting research in prompting and bias in LLMs response. I contributed to open-source and internal projects and honed my skills with state-of-the-art generative models.
- Applying data science and statistical measures like multifractality, different entropy

- Applying data science and statistical measures like multifractality, different entropy analyses, and complexity measures, I have worked in analyzing EEG and eye-tracking data in my research.
- I've initiated a new line of inquiry within my research team, focusing on the exploration of brain connectivity graphs and the development of mathematical models for brain information dynamics.
- I bring a profound enthusiasm for data and the transformative potential of generative models, particularly LLMs. My ambition is to explore both the application and research aspects of these models.

Coding & Data Science
Python (NumPy, SciPy, Matplotlib), Scikit-learn (Data Collection and preprocessing, EDA, Feature Engineering…), Pandas, Visualization Packages, Object-Oriented Programming, A little C++/Qt

Time Series Analysis
Multifractal Detrended Fluctuation Analysis (MF-DFA), Statistical Complexity, Information Entropy, Graph Theory, Network Analysis, Fourier Analysis, Forecasting Techniques

Digital Image Processing
Spectral Processing, Spectral Restoration, Convolution Processing, Directional Filtering, Morphological Processing, Resampling, Reconstruction, Quantization, Segmentation, Multifractal Spectrum

Soft Skills
Conference speaking experience, Scientific Events Organization, 8-year tenure as a Teaching Assistant, Team Work, Scientific Collaborations

Selected Work History

2023 - Present

Data Analyst/Scientist @ Leniolabs LLC

- Developed the backend for a document classification and entity recognition application using OCR, LLMs, and text embedding for similatiry search.

- Collaborated on the development of a marketing analysis and brand protection system.

AI team @ Leniolabs LLC

- LLM and vector database research
- Data exploration, manipulation, processing and analysis

Education

Education

2021- In Progress	**Doctoral Degree in Physics**, Computational Neuroscience research @ Universidad Nacional del Sur, Bahía Blanca
2021	**Bachelor's Degree in Physics**, Universidad Nacional del Sur, Bahía Blanca

Articles and Talks

Articles

- C. D. Duarte; J. I. Specht; F. R. Iaconis; J. I. Ruiz Díaz; L. Azzaretti; C. A. Delrieux; G. Gasaneo. **"Entropy and complexity in electroencephalographic signals for discriminating visual tasks"**. IX Congress of Applied, Computational and Industrial Mathematics. MACI 2023.
- J.I. Specht; L. Dimieri; E. Urdapilleta; G. Gasaneo. **"Minimal dynamical description of eye movements"**. European Physical Journal B - Condensed Matter. Berlin: Springer. 2017 vol.90 n°2.
- J.I. Specht; M.L. Freije; A.L. Frapiccini; R. de Luis Garcia. **"A Simple Physical Representation for Saccadic Eye Movement Data"**. Switzerland. Cham. Book. Full Article. Conference. VI ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing. European Congress on Computational Methods in Applied Sciences and Engineering, 2017.

- M.L. Freije; A.A. Jimenez Gandica; J.I. Specht; G. Gasaneo. **"Multifractal Detrended Fluctuation Analysis of Eye-Tracking Data"**. Switzerland. Cham. Book. Full Article. Conference. VI ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing. European Congress on Computational Methods in Applied Sciences and Engineering, 2017.

Talks

- **"Evaluation tools for auditory capabilities with eye tracking and brain electrical activity monitoring"**, International Conference on Hearing Sciences, MAH, 2022
- **"Implementation of eye-tracking in logoaudiometric evaluation"**, International Conference on Hearing Sciences, MAH, 2022
- **"Brain dynamics diversity: alpha oscillations may represent adaptive changes**

to modernity”, Conference on Fundamentals and Applications of Interdisciplinarity, 2019.

- **“Eye-tracking data modelling with simple driven harmonic oscillators”**, 2nd Congress, Federation of Latin American and Caribbean Neuroscience Societies, 2017.
- **“Multifractal analysis of eye tracking data”**, 2nd Latin American Brain Mapping Network Meeting, 2017.
- **“Eye tracking: from lenses Movements to attention problems”**, 2nd Latin American Brain Mapping Network Meeting, 2017.
- **“Physics of eye movements”**, 1st Argentine Workshop on Vision Neuroscience, 2016.
- **“Activation of saccadic movements in simplified oculo-motor systems”**, Regional Congress on Statistical Physics and Applications to Condensed Matter, 2016.
- **“The mechanics of fading in the visual system”**, VI Argentinian Conference on Bioinformatics and Computational Biology, 2015.