


# 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 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

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| 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.