ANDRÉS BARAJAS

Data Scientist

custore@gmail.com (+33)666032940 Paris, France andbarajas.github.io/
AndresBarajas7 0000-0003-4340-8762

Data Scientist with strong background in signal processing, computational and physical modeling with 5+ experience in research and development projects.
Experience in data analysis, machine learning, deep learning, and signal processing aimed to extract insights from complex datasets. Proficient in Python, C++, and Fortran, with experience developing algorithms for data-driven solutions. Skilled in communication, organization, and problem-solving, with a history of teaching and knowledge sharing across diverse domains.

EXPERIENCE

Post-doc

Signal Analysis

March-2021 - December 2024 ISTerre, Grenoble, France

- Neural network design for seismic signal recovery
- Matrix transformation and decomposition methods for data analysis
- Fourier analysis of volcanic and tectonic signals
- Digital filter design for wave propagation simulation

PhD

Environmental and theoretical seismology

November 2017 - March 2021 ISTerre, Grenoble, France

- Processing and interpretation of GPS, rain and seismic data
- Physical modeling of Earth's waves propagation
- Physical modeling of water levels in underground reservoirs
- Inversion of seismic data to identify changes in the Earth's crust
- Measurement of the seismic velocity changes related to water levels and seismicity

University professor

Physics professor

January 2014 - November 2017 Bogotá, Colombia

- Professor in Universidad America of Classical Mechanics, Hydrostatics, Electrostatic and Modern Physics to students of engineering programs
- Adjunct Professor in Universidad de los Andes of Classical Mechanics, Electrostatic, and Experimental Physics to students of engineering, medicine, and basic science programs

PUBLICATIONS

Journal Articles

- **A. Barajas**, N. M. Shapiro, and G. Prieto, "Differential phase analysis for volcanic tremor detection and source location," *Journal of Geophysical Research: Solid Earth*, vol. 129, no. 10, e2024JB029010, 2024.

SKILLS SUMMARY

Data Analysis
Deep learning, Machine learning, Signal processing, Matrix analysis methods, Physics modeling, Inverse problem, Monte Carlo simulations

Programming Languages
Python (pytorch, pandas, numpy, scipy, igraph), C, C++, Fortran, Bash, Latex.

Software
VSCode, Github, Microsoft Office (Excel, PowerPoint, Word), Illustrator, Photoshop

Operative Systems
Linux, MacOS, Windows

SOFTS SKILLS

Achiever · Big data set management · Writing · Communication Skills · Organization & Time Management

LANGUAGES

Spanish (Native)
English
French
Italian

EDUCATION

Master - Theoretical physics

Univerdad de los Andes

January 2012 – December 2013

Courses: *Advanced quantum mechanics, Electrodynamics, Statistical mechanics, Analytical mechanics*

Bachelor of Sciences-Physics

Universidad Nacional de Colombia

- **A. Barajas**, C. Journeau, K. Obara, and N. M. Shapiro, "Comparison of continuously recorded seismic wavefields in tectonic and volcanic environments based on the network covariance matrix," *Journal of Geophysical Research: Solid Earth*, vol. 128, no. 12, e2023JB026784, 2023.
- **A. Barajas** and N. Shapiro, "Digital filters for waveform generation (in progress)," *Geophysical Journal International*, 2023.
- **A. Barajas**, L. Margerin, and M. Campillo, "Coupled body and surface wave sensitivity kernels for coda-wave interferometry in a three-dimensional scalar scattering medium," *Geophysical Journal International*, vol. 230, no. 2, pp. 1013–1029, 2022.
- **A. Barajas**, P. Poli, N. d'Agostino, L. Margerin, and M. Campillo, "Separation of poroelastic and elastic processes of an aquifer from tectonic phenomena using geodetic, seismic, and meteorological data in the pollino region, italy," *Geochemistry, Geophysics, Geosystems*, vol. 22, no. 11, e2021GC009742, 2021.

February 2004 – June 2010

Courses: *Relativity, Quantum mechanics, Thermodynamics, Integral calculus, Topology, Differential equations*

CONFERENCES

International Conferences

- AGU conferences, 1st author, San Francisco, New Orleans, 2019, 2021.
- EGU conferences, 1st author, Vienna, 2019, 2020, 2022, 2023, 2024.
- Summer school, 1st author, Cargese, 2019, 2022.

INTERESTS

Biology, Language, Teaching, Dancing, Running