

Ana Gabriela Mantilla Dulcey

Geophysics | Scientific Machine Learning | Computational Geoscience

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PROFILE

Ana Gabriela Mantilla Dulcey is a geologist and graduate researcher in geophysics at Universidad Industrial de Santander. Her public research profile centers on machine learning for geophysical inversion, computational geoscience, and subsurface exploration.

EDUCATION

2018 - 2023	Bachelor's degree in Geology Universidad Industrial de Santander completed
2024 - Present	Master's degree in Geophysics Universidad Industrial de Santander publicly listed as a master's student in 2024

RESEARCH EXPERIENCE

Dates TBD	Graduate researcher Semillero de Investigación en Geofísica Aplicada y Computacional (SIGAC), Universidad Industrial de Santander Works on machine learning for geophysical inversion, with interests in field geology, computational geoscience, and economic and geophysical exploration.
Dates TBD	Research participant Semillero de Geofísica UIS Participated in research related to machine learning, computational geoscience, and broadband magnetotelluric subsurface exploration.

RESEARCH INTERESTS

Scientific machine learning | Geophysical inversion | Computational geoscience | Mineral prospectivity mapping | Seismic acquisition and processing | Subsurface exploration | Geospatial artificial intelligence

SELECTED PROJECTS

2024	FIRENET Co-creator A platform for forest-fire management that integrates geospatial technologies, artificial intelligence, open meteorological data, and environmental-crime data. Its neural models forecast monthly temperature and precipitation to help prioritize vulnerable areas.
2022	DesarrolloPoligonales Repository owner Calculation of true bed thickness using the traverses method in Python.

PUBLICATIONS AND SCHOLARLY OUTPUTS

- 2026 **Imaging-Guided Pattern Optimization for Seismic Acquisition Geometries Design With Deep Learning**
Ana Gabriela Mantilla Dulcey, Henry Arguello. IEEE Transactions on Geoscience and Remote Sensing.
- 2025 **3D Seismic Acquisition Design Optimization Regularized by FWI: A Deep Learning Approach**
Ana Gabriela Mantilla Dulcey, Javier Torres-Quintero, Henry Arguello Fuentes. conference paper.
- 2025 **DICE: Diffusion Consensus Equilibrium for Sparse-view CT Reconstruction**
Leon Suarez-Rodriguez, Roman Alejandro Carrascal, Romario Gualdrón-Hurtado, Ana Gabriela Mantilla Dulcey, Henry Arguello. conference paper / preprint.
- 2025 **Poststack seismic data denoising via dynamic guided learning**
Javier Torres-Quintero, Paul Goyes-Peñafiel, Ana Gabriela Mantilla Dulcey, Henry Arguello. The Leading Edge.
- 2025 **Poststack Seismic Data Preconditioning via Dynamic Guided Learning**
Javier Torres-Quintero, Paul Goyes-Peñafiel, Ana Gabriela Mantilla Dulcey, Henry Arguello. preprint.
- 2024 **Porphyry-type mineral prospectivity mapping with imbalanced data via prior geological transfer learning**
Ana Gabriela Mantilla Dulcey, Paul Goyes-Peñafiel, Rosana Baez-Rodríguez, Sait Khurama. Gondwana Research.
- 2024 **Herramientas computacionales para las ciencias de la tierra: uso de Python para resolver problemas geológicos**
Ana Gabriela Mantilla Dulcey, Shaireth Carvajal, Luisa Gómez, Paul Goyes-Peñafiel. XVI Semana Técnica de Geología, Ingeniería Geológica y Geociencias.
DOI: 10.13140/RG.2.2.15988.56969
- 2024 **Inversión 1D y 2D de datos magnetotelúricos para la caracterización de estructuras resistivas profundas**
Ana Gabriela Mantilla Dulcey, Johan Enrique Paez Romero, Ivan Camilo Caballero Jaimes, Paul Goyes-Peñafiel. XVI Semana Técnica de Geología, Ingeniería Geológica y Geociencias.
DOI: 10.13140/RG.2.2.29410.34247
- 2023 **La revolución del aprendizaje automático en la exploración mineral: Predicción espacial de la probabilidad de zonas con ocurrencias minerales**
Ana Gabriela Mantilla Dulcey, Paul Goyes-Peñafiel, Rosana Baez. conference poster.
DOI: 10.13140/RG.2.2.13999.92329
- 2023 **Predicción de la ocurrencia de depósitos minerales tipo pórfido usando técnicas de aprendizaje automático**
Ana Gabriela Mantilla Dulcey. Universidad Industrial de Santander.
- 2021 **Metodología para cartografiar cavidades subterráneas en 3D: caso La Escondida y Las Alsacias (Zapatoca, Santander)**
Ana Gabriela Mantilla Dulcey. conference paper.
- 2021 **Reporte espeleológico de la cueva La Escondida en Zapatoca, Santander**
Diego Zafra Otero, Ana Gabriela Mantilla Dulcey. conference paper.

TEACHING

2022 **Organization of Python workshops for geosciences**
SEG Student Chapter UIS

AWARDS

2024-12 **Second place nationally, Datos a la U competition**
MinTIC / Government Digital Directorate
Project: FIRENET

PROFESSIONAL ACTIVITIES

2022-01 - 2022-12 **Student chapter board member**
Society of Exploration Geophysicists (SEG), UIS Student Chapter
Organized workshops on Python applications for geosciences and activities in near-surface geophysical processing and interpretation.

2022-01 - 2023-01 **Student chapter board member**
Society for Geology Applied to Mineral Deposits, UIS Student Chapter
Organized conferences, courses, field trips, and workshops related to mineral deposits.

TECHNICAL SKILLS

Machine learning | Deep learning | Geophysical inversion | Mineral prospectivity mapping | Geospatial analysis | Field geology | Magnetotellurics | Seismic data processing | Scientific programming

PROGRAMMING AND SOFTWARE

Python | Jupyter Notebook | ArcMap | Visual Topo | GemPy

CERTIFICATIONS

2022-08 **Artificial Intelligence for Oil and Gas Using Python**
American Association of Petroleum Geologists (AAPG)

2021-08 **Técnicas de Machine Learning aplicadas a la predicción mineral con Python**
MINEXFIELD

PUBLIC PROFILES

Google Scholar: https://scholar.google.com/citations?user=y_kOylMAAAAJ&hl;=es
GitHub: <https://github.com/Anagabrielamantilla>
LinkedIn: <https://www.linkedin.com/in/ana-gabriela-mantilla-24377a21a/>