

Thomas Patrick Martin, PhD.

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Professional Experience

Senior Data Scientist, Durin Mining Technologies, El Segundo, California July 2025 – Present

- Establish ML strategy and workflows for hardware and geoscience data using scikit-learn, PyTorch, and other classical/deep learning frameworks
- Architect data pipelines for “rig-to-customer”
- Integrate LLMs and generative AI into data science workflows for ad hoc analysis, report generation, and domain-specific automation
- Develop computer vision ML pipelines for inspection and classification tasks
- Build and maintain CI/CD pipelines for data science products, using AI-augmented coding practices to streamline development and deployment

AI/ML Engineer III, NSF Unidata, Boulder, Colorado July 2022 – July 2025

- Lead training and machine learning experiments with Python packages XGBoost, CatBoost, Keras, Tensorflow, Scikit-Learn, SciPy, and PyTorch packages
- Develop workflows for processing multi-dimensional meteorology datasets for methane leak detection machine learning workflows and analysis
- Staff development and mentorship for upskilling technical staff in machine learning techniques

ML Geoscientist, Leidos supporting NETL, Remote January 2022 - July 2022

- Used machine learning techniques to model subsurface properties and geologic processes for Federal energy projects
- Supported onshore and offshore carbon capture research programs with technical oil and gas expertise
- Developed testable python extract, transform, and loading workflows

Graduate Research Assistant, Colorado School of Mines June 2018 - December 2022

- Researched core lithology/facies prediction using machine learning from images
- Unraveling core-plug-log relationships (porosity, permeability, chemistry, grain-size) using machine learning methods
- Developed best practices for well log-based geoscience machine learning

Geoscience Intern, Minerva Intelligence (acquired by Sequent) May 2021 - August 2021

- Integrated multi-scale geoscience data for automated exploration and development of mineral resources
- Developed workflows for integrating geophysical (gravity, magnetic) data into artificial intelligence and resource modeling software
- Geochemical data pre-processing and leveling analysis using machine learning pre-processing methods

Geoscience Intern, Equinor June 2020 - July 2020

- Developed machine learning workflows to quantitatively analyze unconventional shale formations, accelerating standard workflows to find geochemical analogs
- Worked with a team of geoscientists and engineers to screen opportunities globally

Researcher, Research Corporation, University of Hawaii September 2016 - May 2018

- Electromagnetic Geophysicist for geothermal exploration projects within the state of Hawaii, focusing on Lanai

Geophysicist, GeoTek Hawaii Inc, Honolulu, HI December 2016 - February 2018

- Prepared reports, maps, proposals, and client deliverables for environmental, geotechnical, and geophysical projects throughout the Hawaiian Islands
 - Utilized electrical, seismic, and electromagnetic geophysical methods

- Signal processing of controlled source electromagnetic (CSEM) data
 - Offshore subsurface property inversion using a combination of seismic, electromagnetic, and well log data

Education

PhD, Geology – Colorado School of Mines December 2022

Thesis: "Machine learning and advanced analytics on sedimentary geoscience data"

Master of Science, Earth Sciences - University of California, San Diego March 2015

Thesis: "Mapping Porosity Structure Offshore Torrey Pines State Natural Reserve and Del Mar, California Using a Surface Towed EM System"

Bachelor of Science, Earth Sciences - University of California, San Diego March 2013

National Outdoor Leadership School – Patagonia Semester April 2010

University Teaching Experience

GEOL 557 - Earth Resource Data Science 1: Fall 2020, 2021, 2023, 2024

Fundamentals.

Colorado School of Mines

Graduate class introducing data science techniques and Python to geoscientists

GEOL 558 - Earth Resources Data Science 2: Spring 2025

Applications and Machine Learning

Colorado School of Mines

Project based graduate class on applied ML for geoscience problems

Professional Accomplishments

NSF CyberTraining Award, Co-Principal Investigator, \$300,000 Fall 2023

3rd Place Subsurface Machine Learning Contest Spring 2022
AERA Energy and Studio X (now Think Onward)

Selected Peer Reviewed Publications

Wirz, C. D., Sutter, C., Demuth, J. L., Mayer, K. J., Chapman, W. E., Cains, M. G., Radford, J., Przybylo, V., Evans, A., **Martin, T.**, Gaudet, L. C., Sulia, K., Bostrom, A., Gagne II, D. J., Bassill, N., Schumacher, A., & Thorncroft, C. (2024). Increasing the reproducibility and

replicability of supervised AI/ML in the Earth systems science by leveraging social science methods. *Earth and Space Science*, 11, e2023EA003364.
<https://doi.org/10.1029/2023EA003364>

Jobe, Z., Seckinger, C., **Martin, T.**, Kus, K., & Pettinga, L. (2024). Lateral heterogeneity of basin-plain turbidites of the Cloridorme Formation, Quebec, Canada: Implications for horizontal well prediction. *The Depositional Record*. <https://doi.org/10.1002/dep2.278>

Martin, T., Tadla, J., & Jobe, Z. (2022). Digitalization of Legacy Datasets and Machine Learning Regression Yields Insights for Reservoir Property Prediction and Submarine-Fan Evolution: A Subsurface Example From the Lewis Shale, Wyoming. *The Sedimentary Record*, 20(1), 36638.

Martin, T. P., Meyer, R., & Jobe, Z. (2021). Centimeter-Scale Lithology and Facies Prediction in Cored Wells using Machine Learning. *Frontiers in Earth Science*, 9, 491.

Meyer, R. G., **Martin, T. P.**, & Jobe, Z. R. (2020). CoreBreakout: Subsurface Core Images to Depth-Registered Datasets. *Journal of Open Source Software*, 5(50), 1969.

Lautze, N., Ito, G., Thomas, D., Frazer, N., Martel, S. J., Hinz, N., Tachera, D., Hill, G., Pierce, 705 H. A., Wannamaker, P. E., and **Martin, T.** (2020). Play fairway analysis of geothermal 706 resources across the State of Hawai'i: 4. Updates with new groundwater chemistry, 707 subsurface stress analysis, and focused geophysical surveys. *Geothermics*, 86:101798.

Alvarez, P., A. Alvarez, L. MacGregor, F. Bolivar, R. Keirstead, and **T. Martin**, (2017), Reservoir properties prediction integrating controlled-source electromagnetic, prestack seismic, and well-log data using a rock-physics framework: Case study in the Hoop Area, Barents Sea, Norway: *Interpretation*, 5, no. 2, SE43–SE60, doi: 10.1190/INT-2016-0097.1.