

1. Record Nr.	UNINA9910746284003321
Autore	Petrelli Maurizio
Titolo	Machine learning for earth sciences : using Python to solve geological problems // Maurizio Petrelli
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
ISBN	3-031-35114-2
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (xvi, 209 pages) : illustrations
Collana	Springer Textbooks in Earth Sciences, Geography and Environment, , 2510-1315
Disciplina	550.028557
Soggetti	Earth sciences - Data processing Machine learning Python (Computer program language)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Part 1: Basic Concepts of Machine Learning for Earth Scientists -- Chapter 1. Introduction to Machine Learning -- Chapter 2. Setting Up your Python Environments for Machine Learning -- Chapter 3. Machine Learning Workflow -- Part 2: Unsupervised Learning -- Chapter 4. Unsupervised Machine Learning Methods -- Chapter 5. Clustering and Dimensionality Reduction in Petrology -- Chapter 6. Clustering of Multi-Spectral Data -- Part 3: Supervised Learning -- Chapter 7. Supervised Machine Learning Methods -- Chapter 8. Classification of Well Log Data Facies by Machine Learning -- Chapter 9. Machine Learning Regression in Petrology -- Part 4: Scaling Machine Learning Models -- Chapter 10. Parallel Computing and Scaling with Dask -- Chapter 11. Scale Your Models in the Cloud -- Part 5: Next Step: Deep Learning -- Chapter 12. Introduction to Deep Learning.
Sommario/riassunto	This textbook introduces the reader to Machine Learning (ML) applications in Earth Sciences. In detail, it starts by describing the basics of machine learning and its potentials in Earth Sciences to solve geological problems. It describes the main Python tools devoted to ML, the typical workflow of ML applications in Earth Sciences, and proceeds with reporting how ML algorithms work. The book provides many examples of ML application to Earth Sciences problems in many fields,

such as the clustering and dimensionality reduction in petro-volcanological studies, the clustering of multi-spectral data, well-log data facies classification, and machine learning regression in petrology. Also, the book introduces the basics of parallel computing and how to scale ML models in the cloud. The book is devoted to Earth Scientists, at any level, from students to academics and professionals.
