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Titolo	Artificial Intelligent Approaches in Petroleum Geosciences // edited by Constantin Cranganu, Henri Luchian, Mihaela Elena Breaban
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Descrizione fisica	1 online resource (298 p.)
Disciplina	003.3 006.3 553 621.042 624.151 662.6
Soggetti	Cogeneration of electric power and heat Fossil fuels Artificial intelligence Geotechnical engineering Mathematical models Mineralogy Fossil Fuel Artificial Intelligence Geotechnical Engineering and Applied Earth Sciences Mathematical Modeling and Industrial Mathematics
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intelligent Data Analysis Techniques – Machine Learning and Data Mining -- On meta-heuristics in optimization and data analysis. Application to geosciences -- Genetic Programming Techniques with Applications in the Oil and Gas Industry -- Application of Artificial Neural Networks in Geoscience and Petroleum Industry -- On Support Vector Regression to Predict Poisson's Ratio and Young's Modulus of

Reservoir Rock -- Use of Active Learning Method to determine the presence and estimate the magnitude of abnormally pressured fluid zones: A case study from the Anadarko Basin, Oklahoma -- Active Learning Method for estimating missing logs in hydrocarbon reservoirs -- Improving the accuracy of Active Learning Method via noise injection for estimating hydraulic flow units: An example from a heterogeneous carbonate reservoir -- Well log analysis by global optimization-based interval inversion method -- Permeability estimation in petroleum reservoir by artificial intelligent methods: An overview.

Sommario/riassunto

This book presents several intelligent approaches for tackling and solving challenging practical problems facing those in the petroleum geosciences and petroleum industry. Written by experienced academics, this book offers state-of-the-art working examples and provides the reader with exposure to the latest developments in the field of intelligent methods applied to oil and gas research, exploration and production. It also analyzes the strengths and weaknesses of each method presented using benchmarking, whilst also emphasizing essential parameters such as robustness, accuracy, speed of convergence, computer time, overlearning and the role of normalization. The intelligent approaches presented include artificial neural networks, fuzzy logic, active learning method, genetic algorithms and support vector machines, amongst others. Integration, handling data of immense size and uncertainty, and dealing with risk management are among crucial issues in petroleum geosciences. The problems we have to solve in this domain are becoming too complex to rely on a single discipline for effective solutions, and the costs associated with poor predictions (e.g. dry holes) increase. Therefore, there is a need to establish a new approach aimed at proper integration of disciplines (such as petroleum engineering, geology, geophysics, and geochemistry), data fusion, risk reduction, and uncertainty management. These intelligent techniques can be used for uncertainty analysis, risk assessment, data fusion and mining, data analysis and interpretation, and knowledge discovery, from diverse data such as 3-D seismic, geological data, well logging, and production data. This book is intended for petroleum scientists, data miners, data scientists and professionals and post-graduate students involved in petroleum industry.
