Constantin Cranganu Editor

# Artificial Intelligent Approaches in Petroleum Geosciences

Second Edition



# <u>Artificial Intelligent Approaches In Petroleum</u> <u>Geosciences</u>

Rahman Ashena, William K. Ott

#### **Artificial Intelligent Approaches In Petroleum Geosciences:**

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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

Artificial Intelligent Approaches in Petroleum Geosciences Constantin Cranganu, 2024-07-15 This book presents cutting edge approaches to solving practical problems faced by professionals in the petroleum industry and geosciences With various state of the art working examples from experienced academics the book offers an exposure to the latest developments in intelligent methods for oil and gas research exploration and production This second edition is updated with new chapters on machine learning approaches data driven modelling techniques and neural networks. The book delves into machine learning approaches including evolutionary algorithms swarm intelligence fuzzy logic deep artificial neural networks KNN decision tree random forest XGBoost and LightGBM it also analyzes the strengths and weaknesses of each method and emphasizes essential parameters like robustness accuracy speed of convergence computer time overlearning and normalization Integration data handling risk management and uncertainty management are all crucial issues in petroleum geosciences The complexities of these problems require a multidisciplinary approach that fuses petroleum engineering geology geophysics and geochemistry Essentially this book presents an approach for integrating various disciplines such as data fusion risk reduction and uncertainty management Whether you are a professional or a student you can greatly benefit from the latest advancements in intelligent methods applied to oil and gas research This comprehensive and updated book presents cutting edge approaches and real world examples that can help you in solving the intricate challenges of the petroleum industry and geosciences **Cement Bond Logs** Rahman Ashena, William K. Ott, 2025-11-01 This book focuses on cement bond logs CBL as a critical tool for ensuring long term well integrity It covers key topics such as acoustic fundamentals factors influencing cement bond and variable density log CBL VDL readings cement bond logs evaluation and methods to address the microannulus effect which can lead to misleading log results It also includes a discussion of waveforms particularly in relation to VDL readings The book explores how both conventional sonic and new ultrasonic technologies capture and interpret waveforms to assess variations in cement bond integrity Practical case studies are provided to demonstrate how sonic and ultrasonic CBL interpretation can improve decision making in assessing well integrity Additional guidance is provided on evaluating log quality supervising and witnessing logging operations and comparing different logging tools Cement Bond Logs Guidelines and Interpretation serves as an essential resource for engineers and researchers seeking to improve wellbore integrity through practical and accurate cement evaluation **Coring Methods and Systems** Rahman Ashena, Gerhard Thonhauser, 2018-05-02 This book is a practical guide to downhole rock sampling and coring concepts methods systems and procedures for practitioners and researchers Its chapters are based upon years of extensive studies and research about the coring methods and via direct and continuous communication and consultation obtained from various

service and operator companies such as Baker Hughes GE NOV OMV and Sandvik The contributors discuss the state of the art coring methods and systems mainly used in the petroleum industry which include conventional coring wireline continuous coring invasion mitigation coring low invasion gel coring sponge coring jam detection anti jamming full closure safe coring and tripping oriented coring pressure in situ coring logging while coring motor coring mini coring coiled Tubing Coring and underbalanced coring The contributors provide practical and applicable understanding of the procedures of these coring methods and systems as well as the specific core barrel components working mechanisms and schematics of the tools and processes used Because Coring Methods and Systems analyses and compares the core barrels used in both petroleum and mining industries it enhances the communication and may allow knowledge transfer between the two industries As core damage is a serious issue during coring and handling jeopardizing correct calibration of exploration data Coring Methods and Systems has greatly focused on its identification and its mitigation Therefore it can be used as an ideal source for geologists core analysts and reservoir engineers to ensure the retrieval of high quality cores Advances and applications of artificial intelligence in geoscience and remote sensing Peng Zhenming, Sanyi Yuan, Xiaolan Qiu, Wenjuan Zhang, Anna The Practical Handbook of Well Control Rahman Ashena, 2025-02-21 The Practical Handbook of Sowizdzal.2023-08-30 Well Control teaches readers to safeguard well safety and integrity in drilling well engineering Offering an applied and scientific point of view it covers fundamental aspects of well control and includes practical procedures and well control methods for land and offshore operations It features a wealth of questions to commonly encountered problems and comprehensive answers at the end of each topical discussion to test reader comprehension Written in a concise accessible way by experienced oilfield and academic experts Covers all related technical subjects of well control Describes modern aspects of well control including automatic well control advances in outflow measurement artificial intelligence and IoT techniques for early kick detection mud gas separators and riser gas modeling Includes case studies to familiarize readers with real world problems and solutions Offers a full explanation of each problem to familiarize readers with commonly faced issues Features sample exercises with comprehensive answers useful for IWCF and IADC exams This handbook serves as a valuable reference and workbook for field drilling and workover engineers in the energy sector Handbook of Energy **Transitions** Muhammad Asif, 2022-10-14 The global energy scenario is undergoing an unprecedented transition In the wake of enormous challenges such as increased population higher energy demands increasing greenhouse gas emissions depleting fossil fuel reserves volatile energy prices geopolitical concerns and energy insecurity issues the energy sector is experiencing a transition in terms of energy resources and their utilization This modern transition is historically more dynamic and multidimensional compared to the past considering the vast technological advancements socioeconomic implications and political responses and ever evolving global policies and regulations Energy insecurity in terms of its critical dimensions access affordability and reliability remains a major problem hindering the socioeconomic progress in developing countries

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