1. Record Nr. UNINA9911006643403321

Titolo	Soft computing and intelligent data analysis in oil exploration / / edited by M. Nikravesh, F. Aminzadeh, L.A. Zadeh
Pubbl/distr/stampa	Amsterdam ; ; Boston, : Elsevier, 2003
ISBN	1-281-03881-4 9786611038816 0-08-054132-1
Edizione	[1st ed.]
Descrizione fisica	1 online resource (755 p.)
Collana	Developments in petroleum science, , 0376-7361 ; ; 51
Altri autori (Persone)	NikraveshMasoud <1959-> AminzadehFred ZadehLotfi Asker
Disciplina	622/.18282/0285
Soggetti	Petroleum - Prospecting - Data processing Hydrocarbon reservoirs - Computer simulation Soft computing
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and indexes.
Nota di contenuto	Front Cover; Development in Petroleum Science: Soft Computing and Intellegent Data Analysis in Oil Exploration; Copyright Page; Foreword; Preface; About the Editors; List of Contributors; Contents; Part 1: Introduction: Fundamentals of Soft Computing; CHAPTER 1. SOFT COMPUTING FOR INTELLIGENT RESERVOIR CHARACTERIZATION AND MODELING; Abstract; 1. Introduction; 2. The role of soft computing techniques for intelligent reservoir characterization and exploration; 3. Artificial neural network and geoscience applications of artificial neural networks for exploration; 4. Fuzzy logic 5. Genetics algorithms6. Principal component analysis and wavelet; 7. Intelligent reservoir characterization; 8. Fractured reservoir characterization; 9. Future trends and conclusions; Appendix A. A basic primer on neural network and fuzzy logic terminology; Appendix B. Neural networks; Appendix C. Modified Levenberge-Marquardt technique; Appendix D. Neuro-fuzzy models; Appendix E. K-means clustering; Appendix F. Fuzzy c-means clustering; Appendix G. Neural network clustering; References; CHAPTER 2. FUZZY LOGIC; Abstract; 1.

Fuzzy sets; 2. Operations on fuzzy sets
3. Arithmetic of fuzzy intervals4. Fuzzy relations; 5. Fuzzy systems; 6. Fuzzy propositions; 7. Approximate reasoning; 8. Suggestions for further study; References; CHAPTER 3. INTRODUCTION TO USING GENETIC ALGORITHMS; 1. Introduction; 2. Background to Genetic Algorithms; 3. Design of a Genetic Algorithm; 4. Conclusions; References; CHAPTER 4. HEURISTIC APPROACHES TO COMBINATORIAL OPTIMIZATION; 1. Introduction; 2. Decision variables; 3. Properties of the objective function; 4. Heuristic techniques; References; CHAPTER 5. INTRODUCTION TO GEOSTATISTICS; 1. Introduction; 2. Random variables
3. Covariance and spatial variability4. Kriging; 5. Stochastic simulations; References; CHAPTER 6. GEOSTATISTICS: FROM PATTERN RECOGNITION TO PATTERN REPRODUCTION; 1. Introduction; 2. The decision of stationarity; 3. The multi-Gaussian approach to spatial estimation and simulation; 4. Spatial interpolation with kriging; 5. Beyond two-point models: multiple-point geostatistics; 6. Conclusions; 7. Glossary; References; Part 2: Geophysical Analysis and Interpretation; CHAPTER 7. MINING AND FUSION OF PETROLEUM DATA WITH FUZZY LOGIC AND NEURAL NETWORK AGENTS; Abstract; 1. Introduction
2. Neural network and nonlinear mapping3. Neuro-fuzzy model for rule extraction; 4. Conclusion; Appendix A. Basic primer on neural network and fuzzy logic terminology; Appendix B. Neural networks; Appendix C. Modified Levenberge-Marquardt technique; Appendix D. Neuro-fuzzy models; Appendix E. K-means clustering; References; CHAPTER 8. TIME LAPSE SEISMIC AS A COMPLEMENTARY TOOL FOR IN-FILL DRILLING; Abstract; 1. Introduction; 2. Feasibility study; 3. 3D seismic data sets; 4. 4D seismic analysis approach; 5. Seismic modeling of various flow scenarios; 6. 4D seismic for detecting fluid movement
7. 4D seismic for detecting pore pressure changes

Sommario/riassunto

This comprehensive book highlights soft computing and geostatistics applications in hydrocarbon exploration and production, combining practical and theoretical aspects. It spans a wide spectrum of applications in the oil industry, crossing many discipline boundaries such as geophysics, geology, petrophysics and reservoir engineering. It is complemented by several tutorial chapters on fuzzy logic, neural networks and genetic algorithms and geostatistics to introduce these concepts to the uninitiated. The application areas include prediction of reservoir properties (porosity, sand thic