1. Record Nr. UNINA9910830854903321

Titolo	Optimization techniques in engineering : advances and applications / / edited by Anita Khosla [and three others]
Pubbl/distr/stampa	Hoboken, NJ : , : John Wiley & Sons, Inc., and Scrivener Publishing LLC, , [2023] ©2023
ISBN	1-119-90639-3 1-119-90638-5
Descrizione fisica	1 online resource (543 pages)
Collana	Sustainable Computing and Optimization Series
Disciplina	620.0015118
Soggetti	Engineering - Mathematical models
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover -- Title Page -- Copyright Page -- Contents -- Preface -- Acknowledgment -- Part 1: Soft Computing and Evolutionary-Based Optimization -- Chapter 1 Improved Grey Wolf Optimizer with Levy Flight to Solve Dynamic Economic Dispatch Problem with Electric Vehicle Profiles -- 1.1 Introduction -- 1.2 Problem Formulation -- 1.2.1 Power Output Limits -- 1.2.2 Power Balance Limits -- 1.2.3 Ramp Rate Limits -- 1.2.4 Electric Vehicles -- 1.3 Proposed Algorithm -- 1.3.1 Overview of Grey Wolf Optimizer -- 1.3.2 Improved Grey Wolf Optimizer with Levy Flight -- 1.3.3 Modeling of Prey Position with Levy Flight Distribution -- 1.4 Simulation and Results -- 1.4.1 Performance of Improved GWOLF on Benchmark Functions -- 1.4.2 Performance of Improved GWOLF for Solving DED for the Different Charging Probability Distribution -- 1.5 Conclusion -- References -- Chapter 2 Comparison of YOLO and Faster R-CNN on Garbage Detection -- 2.1 Introduction -- 2.2 Garbage Detection -- 2.2.1 Transfer Learning-Technique -- 2.2.2 Inception-Custom Model -- 2.3 Experimental Results -- 2.3.1 Results Obtained Using YOLO Algorithm -- 2.3.2 Results Obtained Using Faster R-CNN -- 2.4 Future Scope -- 2.5 Conclusion -- References -- Chapter 3 Smart Power Factor Correction and Energy Monitoring System -- 3.1 Introduction -- 3.2 Block Diagram -- 3.2.1 Power Factor Concept -- 3.2.2 Power Factor Calculation -- 3.3

Simulation -- 3.4 Conclusion -- References -- Chapter 4 ANN-Based Maximum Power Point Tracking Control Configured Boost Converter for Electric Vehicle Applications -- 4.1 Introduction -- 4.2 Block Diagram -- 4.3 ANN-Based MPPT for Boost Converter -- 4.4 Closed Loop Control -- 4.5 Simulation Results -- 4.6 Conclusion -- References -- Chapter 5 Single/Multijunction Solar Cell Model Incorporating Maximum Power Point Tracking Scheme Based on Fuzzy Logic Algorithm -- 5.1 Introduction.
5.2 Modeling Structure -- 5.2.1 Single-Junction Solar Cell Model -- 5.2.2 Modeling of Multijunction Solar PV Cell -- 5.3 MPPT Design Techniques -- 5.3.1 Design of MPPT Scheme Based on P&amp -- O Technique -- 5.3.2 Design of MPPT Scheme Based on FLA -- 5.4 Results and Discussions -- 5.4.1 Single-Junction Solar Cell -- 5.4.2 Multijunction Solar PV Cell -- 5.4.3 Implementation of MPPT Scheme Based on P&amp -- O Technique -- 5.4.4 Implementation of MPPT Scheme Based on FLA -- 5.5 Conclusion -- References -- Chapter 6 Particle Swarm Optimization: An Overview, Advancements and Hybridization -- 6.1 Introduction -- 6.2 The Particle Swarm Optimization: An Overview -- 6.3 PSO Algorithms and Pseudo-Code -- 6.3.1 PSO Algorithm -- 6.3.2 Pseudo-Code for PSO -- 6.3.3 PSO Limitations -- 6.4 Advancements in PSO and Its Perspectives -- 6.4.1 Inertia Weight -- 6.4.2 Constriction Factors -- 6.4.3 Topologies -- 6.4.4 Analysis of Convergence -- 6.5 Hybridization of PSO -- 6.5.1 PSO Hybridization with Artificial Bee Colony (ABC) -- 6.5.2 PSO Hybridization with Ant Colony Optimization (ACO) -- 6.5.3 PSO Hybridization with Genetic Algorithms (GA) -- 6.6 Area of Applications of PSO -- 6.7 Conclusions -- References -- Chapter 7 Application of Genetic Algorithm in Sensor Networks and Smart Grid -- 7.1 Introduction -- 7.2 Communication Sector -- 7.2.1 Sensor Networks -- 7.3 Electrical Sector -- 7.3.1 Smart Microgrid -- 7.4 A Brief Outline of GAs -- 7.5 Sensor Network's Energy Optimization -- 7.6 Sensor Network's Coverage and Uniformity Optimization Using GA -- 7.7 Use GA for Optimization of Reliability and Availability for Smart Microgrid -- 7.8 GA Versus Traditional Methods -- 7.9 Summaries and Conclusions -- References -- Chapter 8 AI-Based Predictive Modeling of Delamination Factor for Carbon Fiber-Reinforced Polymer (CFRP) Drilling Process -- 8.1 Introduction.
8.2 Methodology -- 8.3 AI-Based Predictive Modeling -- 8.3.1 Linear Regression -- 8.3.2 Random Forests -- 8.3.3 XGBoost -- 8.3.4 SVM -- 8.4 Performance Indices -- 8.4.1 Root Mean Squared Error (RMSE) -- 8.4.2 Mean Squared Error (MSE) -- 8.4.3 R2 (R-Squared) -- 8.5 Results and Discussion -- 8.5.1 Key Performance Metrics (KPIs) During the Model Training Phase -- 8.5.2 Key Performance Index Metrics (KPIs) During the Model Testing Phase -- 8.5.3 K Cross Fold Validation -- 8.6 Conclusions -- References -- Chapter 9 Performance Comparison of Differential Evolutionary Algorithm-Based Contour Detection to Monocular Depth Estimation for Elevation Classification in 2D Drone-Based Imagery -- 9.1 Introduction -- 9.2 Literature Survey -- 9.3 Research Methodology -- 9.3.1 Dataset and Metrics -- 9.4 Result and Discussion -- 9.5 Conclusion -- References -- Chapter 10 Bioinspired MOPSO-Based Power Allocation for Energy Efficiency and Spectral Efficiency Trade-Off in Downlink NOMA -- 10.1 Introduction -- 10.2 System Model -- 10.3 User Clustering -- 10.4 Optimal Power Allocation for EE-SE Tradeoff -- 10.4.1 Multiobjective Optimization Problem -- 10.4.2 Multiobjective PSO -- 10.4.3 MOPSO Algorithm for EE-SE Trade-Off in Downlink NOMA -- 10.5 Numerical Results -- 10.6 Conclusion -- References -- Chapter 11 Performances of Machine Learning Models and Featurization Techniques on Amazon Fine Food

Reviews -- 11.1 Introduction -- 11.1.1 Related Work -- 11.2 Materials and Methods -- 11.2.1 Data Cleaning and Pre-Processing -- 11.2.2 Feature Extraction -- 11.2.3 Classifiers -- 11.3 Results and Experiments -- 11.4 Conclusion -- References -- Chapter 12 Optimization of Cutting Parameters for Turning by Using Genetic Algorithm -- 12.1 Introduction -- 12.2 Genetic Algorithm GA: An Evolutionary Computational Technique -- 12.3 Design of Multiobjective Optimization Problem.
12.3.1 Decision Variables -- 12.3.2 Objective Functions -- 12.3.3 Bounds of Decision Variables -- 12.3.4 Response Variables -- 12.4 Results and Discussions -- 12.4.1 Single Objective Optimization -- 12.4.2 Results of Multiobjective Optimization -- 12.5 Conclusion -- References -- Chapter 13 Genetic Algorithm-Based Optimization for Speech Processing Applications -- 13.1 Introduction to GA -- 13.1.1 Enhanced GA -- 13.2 GA in Automatic Speech Recognition -- 13.2.1 GA for Optimizing Off-Line Parameters in Voice Activity Detection (VAD) -- 13.2.2 Classification of Features in ASR Using GA -- 13.2.3 GA-Based Distinctive Phonetic Features Recognition -- 13.2.4 GA in Phonetic Decoding -- 13.3 Genetic Algorithm in Speech Emotion Recognition -- 13.3.1 Speech Emotion Recognition -- 13.3.2 Genetic Algorithms in Speech Emotion Recognition -- 13.4 Genetic Programming in Hate Speech Using Deep Learning -- 13.4.1 Introduction to Hate Speech Detection -- 13.4.2 GA Integrated With Deep Learning Models for Hate Speech Detection -- 13.5 Conclusion -- References -- Chapter 14 Performance of P, PI, PID, and NARMA Controllers in the Load Frequency Control of a Single-Area Thermal Power Plant -- 14.1 Introduction -- 14.2 Single-Area Power System -- 14.3 Automatic Load Frequency Control (ALFC) -- 14.4 Controllers Used in the Simulink Model -- 14.4.1 PID Controller -- 14.4.2 PI Controller -- 14.4.3 P Controller -- 14.5 Circuit Description -- 14.6 ANN and NARMA L2 Controller -- 14.7 Simulation Results and Comparative Analysis -- 14.8 Conclusion -- References -- Part 2: Decision Science and Simulation-Based Optimization -- Chapter 15 Selection of Nonpowered Industrial Truck for Small Scale Manufacturing Industry Using Fuzzy VIKOR Method Under FMCDM Environment -- 15.1 Introduction -- 15.2 Fuzzy Set Theory -- 15.2.1 Some Important Fuzzy Definitions -- 15.2.2 Fuzzy Operations.
15.2.3 Linguistic Variable (LV) -- 15.3 FVIKOR -- 15.4 Problem Definition -- 15.5 Results and Discussions -- 15.6 Conclusions -- References -- Chapter 16 Slightly and Almost Neutrosophic gs*-Continuous Function in Neutrosophic Topological Spaces -- 16.1 Introduction -- 16.2 Preliminaries -- 16.3 Slightly Neutrosophic gs* - Continuous Function -- 16.4 Almost Neutrosophic gs* - Continuous Function -- 16.5 Conclusion -- References -- Chapter 17 Identification and Prioritization of Risk Factors Affecting the Mental Health of Farmers -- 17.1 Introduction -- 17.2 Materials and Methods -- 17.2.1 ELECTRE Technique -- 17.3 Result and Discussion -- 17.4 Conclusion -- References -- Chapter 18 Multiple Objective and Subjective Criteria Evaluation Technique (MOSCET): An Application to Material Handling System Selection -- 18.1 Introduction -- 18.2 Multiple Objective and Subjective Criteria Evaluation Technique (MOSCET): The Proposed Algorithm -- 18.3 Illustrative Example -- 18.3.1 Problem Definition -- 18.3.2 Calculation and Discussions -- 18.4 Conclusions -- References -- Chapter 19 Evaluation of Optimal Parameters to Enhance Worker's Performance in an Automotive Industry -- 19.1 Introduction -- 19.2 Methodology -- 19.3 Results and Discussion -- 19.4 Conclusions -- References -- Chapter 20 Determining Key Influential Factors of Rural Tourism-An AHP Model -- 20.1 Introduction -- 20.2 Rural Tourism --

20.3 Literature Review -- 20.4 Objectives -- 20.5 Methodology -- 20.6 Analysis -- 20.7 Results and Discussion -- 20.8 Conclusions -- 20.9 Managerial Implications -- References -- Chapter 21 Solution of a Pollution-Based Economic Order Quantity Model Under Triangular Dense Fuzzy Environment -- 21.1 Introduction -- 21.1.1 Overview -- 21.1.2 Motivation and Specific Study -- 21.2 Preliminaries -- 21.2.1 Pollution Function -- 21.2.2 Triangular Dense Fuzzy Set (TDFS). 21.3 Notations and Assumptions.

Sommario/riassunto

OPTIMIZATION TECHNIQUES IN ENGINEERING The book describes the basic components of an optimization problem along with the formulation of design problems as mathematical programming problems using an objective function that expresses the main aim of the model, and how it is to be either minimized or maximized; subsequently, the concept of optimization and its relevance towards an optimal solution in engineering applications, is explained. This book aims to present some of the recent developments in the area of optimization theory, methods, and applications in engineering. It focuses on the metaphor of the inspired system and how to configure and apply the various algorithms. The book comprises 30 chapters and is organized into two parts: Part I -- Soft Computing and Evolutionary-Based Optimization; and Part II -- Decision Science and Simulation-Based Optimization, which contains application-based chapters. Readers and users will find in the book: An overview and brief background of optimization methods which are used very popularly in almost all applications of science, engineering, technology, and mathematics; An in-depth treatment of contributions to optimal learning and optimizing engineering systems; Maps out the relations between optimization and other mathematical topics and disciplines; A problem-solving approach and a large number of illustrative examples, leading to a step-by-step formulation and solving of optimization problems. Audience Researchers, industry professionals, academicians, and doctoral scholars in major domains of engineering, production, thermal, electrical, industrial, materials, design, computer engineering, and natural sciences. The book is also suitable for researchers and postgraduate students in mathematics, applied mathematics, and industrial mathematics.