1. Record Nr. UNINA9910437795403321

Titolo	DNA nanotechnology : from structure to function / / Chunhai Fan, editor
Pubbl/distr/stampa	Berlin ; ; New York, : Springer, c2013
ISBN	3-642-36077-7
Edizione	[1st ed. 2013.]
Descrizione fisica	1 online resource (viii, 362 pages) : illustrations (some color)
Collana	Gale eBooks
Altri autori (Persone)	FanChunhai
Disciplina	572.860284
Soggetti	Biotechnology DNA Genetic engineering
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.
Nota di contenuto	Part I Elements of DNA Nanotechnology -- Brief History of DNA Nanotechnology -- Functional Nucleic Acids for DNA Nanotechnology -- Selenium Atom-Specific Mutagenesis (SAM) for Crystallography, DNA Nanostructure Design, and Other Applications -- Liposomes for DNA Nanotechnology: Preparation, Properties and Applications -- Manipulation and Isolation Individual DNA Molecules with Atomic Force Microscope -- Single Molecule Mechanics of DNA -- Microfluidic Tools for DNA Analysis -- Part II Static and Dynamic DNA Nanotechnology -- DNA-Directed Assembly of Nanophase Materials: An Updated Review -- Self-Assembled DNA-Inorganic Nanoparticle Structures -- DNA Origami Nanostructures -- Design, Fabrication and Applications of DNA Nanomachines -- DNA Walking Devices -- Part III Applications of DNA Nanotechnology -- Functional DNA Integrated Nanomaterials for Biosensing -- Nucleic Acid Enzymes-Based DNA Nanomachine for Biosensing -- DNA Nanotechnology and Drug Delivery -- DNA-Nanotube-Enabled NMR Structure Determination of Membrane Proteins -- Deoxyribozyme-Based Molecular Computation.
Sommario/riassunto	DNA nanotechnology: From structure to function presents an overview of various facets of DNA nanotechnology, with a particular focus on their promising applications. This book is composed of three parts. Part I, Elements of DNA Nanotechnology, provides extensive basic information on DNA nanotechnology. Part II, Static and Dynamic DNA

	Nanotechnology, describes the design and fabrication of static and dynamic DNA nanostructures. Recent advances in DNA origami, DNA walkers and DNA nanodevices are all covered in this part. Part III, Applications of DNA Nanotechnology, introduces a variety of applications of DNA nanotechnology, including biosensing, computation, drug delivery, etc. Together these provide a comprehensive overview of this emerging area and its broad impact on biological and medical sciences. This book is intended for post-graduates, post-doctoral researchers and research scientists who are interested in expanding their knowledge of DNA nanotechnology. It provides readers an impression of the latest developments in this exciting filed.

2.

Record Nr.	UNINA9911018886203321
Autore	Kulkarni Shrikaant
Titolo	Artificial Intelligence-Driven Models for Environmental Management
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2025 ©2025
ISBN	9781394282548
Edizione	[1st ed.]
Descrizione fisica	1 online resource (349 pages)
Disciplina	363.7363028563
Soggetti	Environmental monitoring - Technological innovations Pollution - Measurement - Technological innovations Artificial intelligence - Scientific applications
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Title Page -- Copyright Page -- Contents -- List of Contributors -- Preface -- Part I Foundations of AI in Environmental Management -- Chapter 1 Application of AI in Environmental Sustainability -- 1.1 Introduction -- 1.1.1 Importance of AI in Addressing Environmental Challenges -- 1.2 AI Applications in Environmental Monitoring -- 1.2.1 Remote Sensing and Satellite Imaging -- 1.2.2 IoT Sensors and Data Collection -- 1.2.3 Predictive

Analytics for Environmental Health -- 1.2.4 Real-Time Monitoring of Air and Water Quality -- 1.3 AI in Climate Change Mitigation -- 1.3.1 Predicting and Analyzing Climate Trends -- 1.3.2 AI-Driven Carbon Footprint Reduction Strategies -- 1.3.3 Renewable Energy Optimization Through AI -- 1.3.4 AI in Forest Conservation and Reforestation -- 1.4 AI in Resource Management -- 1.4.1 Sustainable Agriculture and AI-Assisted Precision Farming -- 1.4.2 AI in Water Resource Management and Conservation -- 1.4.3 Waste Management and Recycling Optimization -- 1.4.4 Circular Economy and Resource Efficiency -- 1.5 AI in Biodiversity Conservation -- 1.5.1 Wildlife Monitoring and Poaching Prevention -- 1.5.2 AI-Assisted Habitat Restoration -- 1.5.3 Species Identification and Population Tracking -- 1.5.4 Marine Ecosystem Management Through AI -- 1.6 AI in Sustainable Urban Planning -- 1.6.1 Smart Cities and Sustainable Infrastructure -- 1.6.2 AI in Reducing Urban Energy Consumption -- 1.6.3 Optimizing Urban Traffic for Reduced Emissions -- 1.6.4 AI-Enabled Green Building Design -- 1.7 Ethical and Governance Considerations -- 1.7.1 Ethical Implications of AI in Environmental Management -- 1.7.2 AI and Environmental Justice -- 1.7.3 Regulatory Frameworks for AI in Sustainability -- 1.7.4 Data Privacy and Security in Environmental AI Applications -- 1.7.5 Case Study -- 1.7.5.1 Background -- 1.7.5.2 Conclusion.
1.8 Challenges and Future Prospects -- 1.8.1 Technological and Resource Limitations -- 1.8.2 Potential Risks and Unintended Consequences -- 1.8.3 AI's Role in Achieving Global Sustainability Goals -- 1.8.4 Future Directions in AI for Environmental Sustainability -- 1.9 Conclusion -- References -- Chapter 2 The Role of AI in Environmental Research and Sustainability -- 2.1 Introduction -- 2.1.1 Overview of AI in Environmental Research -- 2.1.2 Importance of AI in Sustainability Efforts -- 2.1.3 Scope and Objectives of the Study -- 2.2 AI Applications in Environmental Monitoring -- 2.2.1 Remote Sensing and Satellite Imaging -- 2.2.2 AI for Climate Modeling and Forecasting -- 2.2.3 Real-Time Environmental Data Collection -- 2.3 AI in Natural Resource Management -- 2.3.1 Optimizing Water and Energy Use -- 2.3.2 Smart Agriculture and Precision Farming -- 2.3.3 AI for Sustainable Fisheries and Forest Management -- 2.4 AI for Biodiversity and Ecosystem Conservation -- 2.4.1 AI-Powered Species Identification and Tracking -- 2.4.2 Monitoring and Protecting Endangered Species -- 2.4.3 Predictive Analytics in Habitat Restoration -- 2.5 AI in Urban Sustainability -- 2.5.1 AI in Smart Cities and Sustainable Urban Planning -- 2.5.2 Optimizing Transportation and Energy Grids -- 2.5.3 Waste Management and Recycling Innovations -- 2.6 Reducing Environmental Footprints with AI -- 2.6.1 AI for Energy Efficiency in Industries -- 2.6.2 AI and Carbon Emissions Reduction -- 2.6.3 AI in the Circular Economy and Waste Reduction -- 2.7 Ethical Considerations in AI-Driven Environmental Research -- 2.7.1 AI Ethics and Environmental Justice -- 2.7.2 Data Privacy and Security in Environmental Monitoring -- 2.7.3 Accountability and Transparency in AI Models -- 2.8 Case Study -- 2.8.1 Background -- 2.8.2 AI Implementation -- 2.8.3 Quantitative Analysis.
2.8.4 Challenges and Opportunities -- 2.9 Conclusion -- References -- Chapter 3 AI and Environmental Data Science -- 3.1 Introduction -- 3.1.1 Background of AI in Environmental Science -- 3.1.2 Importance of Data Science in Environmental Studies -- 3.1.3 Objectives of the Study -- 3.2 Fundamentals of Artificial Intelligence -- 3.2.1 Overview of AI Techniques -- 3.2.2 Machine Learning vs. Traditional Approaches -- 3.2.3 Deep Learning and its Applications -- 3.3 Environmental Data Science -- 3.3.1 Definition and Scope -- 3.3.2 Types of Environmental

Challenges and Barriers to AI Implementation -- 5.7.1 Data Privacy Concerns -- 5.7.2 Ethical Considerations -- 5.7.3 The Digital Divide -- 5.8 Case Study -- 5.8.1 Objectives of the Case Study -- 5.8.2 Methodology -- 5.8.3 Quantitative Analysis -- 5.9 Conclusion -- References -- Part III AI Models for Climate Change Mitigation and Adaptation -- Chapter 6 AI in Climate Change Prediction -- 6.1 Introduction -- 6.1.1 Role of AI in Climate Science -- 6.1.2 How AI Enhances Climate Change Prediction -- 6.1.3 Real-World Applications of AI in Climate Prediction -- 6.1.4 AI and Climate Mitigation -- 6.1.5 Challenges and Limitations of AI in Climate Prediction -- 6.2 AI Technologies in Climate Prediction -- 6.2.1 Machine Learning for Climate Data Analysis -- 6.2.2 Deep Learning in Climate Models -- 6.2.3 AI-Powered Satellite Imagery Analysis -- 6.2.4 AI in Weather Forecasting and Extreme Event Prediction -- 6.3 AI Applications in Climate Science -- 6.3.1 Predicting Extreme Weather Events -- 6.3.2 Long-Term Climate Projections -- 6.3.3 AI in Ocean and Polar Ice Monitoring -- 6.3.4 AI in Air Quality and Pollution Forecasting -- 6.4 AI for Climate Mitigation and Adaptation -- 6.4.1 Optimizing Energy Consumption and Emission Reduction -- 6.4.2 AI in Renewable Energy Integration -- 6.4.3 AI in Smart Grids and Infrastructure.
6.4.4 AI for Carbon Sequestration and Natural Resource Management.

Sommario/riassunto

"This book provides tools and methods to monitor and predict environmental pollutants faster and more accurately. It covers different AI models and tools for achieving sustainable environmental development along as well as recent research directions for environmental issues. The book introduces novel intelligent techniques needed to address environmental pollution for global environmental health and puts forth insights on the next generation of intelligent pollution monitoring techniques. Topics include: Application of AI in Environmental Sustainability; The Role of AI in Environmental Research and Sustainability; The Living Environment and New Era of AI Education for a Sustainable Future; Managing Natural Resources Through Innovation: The Importance of Sustainable AI; AI-powered Soil Management; AI for Evaluation of the Impacts of Environmental Pollution on Human Health; Man-made Environmental Pollution with an Eye to Future Reduction using AI Network Techniques; AI Technology for Protection of Water Supplies from Contamination to Produce Healthy Foods; AI and Waste Management Technologies for Sustainable Agriculture; The Environmental AI Economy on Natural Resources Management; Environmental, Social and Economic Aspects of Natural Resource: AI Law and Policy Implications to Protect the Earth; AI in Healthy Natural Resource Management: Healthy Soils for Healthy Food Productions; Future Directions of AI for Management of Natural Resources"--