1. Record Nr. UNINA9911019472703321

Autore	Gangadevi E
Titolo	Automated Machine Learning and Industrial Applications
Pubbl/distr/stampa	Newark : , : John Wiley & Sons, Incorporated, , 2025 ©2025
ISBN	1-394-27242-1 1-394-27241-3
Edizione	[1st ed.]
Descrizione fisica	1 online resource (351 pages)
Altri autori (Persone)	ShriM. Lawanya BalusamyBalamurugan DhanarajRajesh Kumar
Disciplina	006.3/1
Soggetti	Machine learning
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Series Page -- Title Page -- Copyright Page -- Contents -- Preface -- Chapter 1 Design and Architecture of AutoML for Data Science in Next-Generation Industries -- 1.1 Introduction -- 1.2 Modular Design -- 1.3 Data Handling -- 1.4 Model Training and Selection -- Conclusion -- References -- Chapter 2 Automated Machine Learning Model in Secure Data Transmission in Sustainable Healthcare Sensor Network Using Quantum Blockchain Architecture -- 2.1 Introduction -- 2.2 Related Works -- 2.3 Proposed Model -- 2.4 Results and Discussion -- 2.5 Conclusion -- References -- Chapter 3 Automated Machine Learning in the Biological and Medical Healthcare Industries: Analysis Interpretation and Evaluation -- 3.1 Introduction -- 3.1.1 Rise of AutoML -- 3.1.2 Significance of AutoML in Biological and Medical Healthcare -- 3.2 Methodology for Effective Data Management -- 3.3 Foundations of Automated Machine Learning -- 3.3.1 Understanding Automated Machine Learning -- 3.3.2 Components and Workflow -- 3.3.3 Pros of AutoML Implementation -- 3.3.4 Cons of AutoML Implementation -- 3.4 Applications in Healthcare -- 3.4.1 Disease Diagnosis -- 3.4.2 Drug Discovery and Development -- 3.4.3 Personalized Medicine -- 3.4.4 Predictive Analytics in Healthcare -- 3.5 Case Studies and Success Stories -- 3.5.1 Noteworthy Implementations

9.4.2 IBM Watson AutoAI -- 9.4.3 Microsoft Azure AutoML -- 9.4.4 H2O.ai -- 9.4.5 Data Robot -- 9.4.6 Databricks AutoML -- 9.4.7 Tune -- 9.4.8 AutoKeras -- 9.4.9 H2O Driverless AI -- 9.4.10 RapidMiner -- 9.4.11 Google Cloud AutoML Tables -- 9.4.12 H2O Sparkling Water -- 9.4.13 Turi Create -- 9.4.14 Big ML -- 9.4.15 Hail -- 9.5 Open-Source AutoML Libraries -- 9.5.1 Auto-Sklearn -- 9.5.2 TPOT (Tree-Based Pipeline Optimization Tool).
9.5.3 AutoKeras -- 9.5.4 MLBox -- 9.5.5 AutoGluon -- 9.5.6 H2O AutoML -- 9.5.7 Auto-WEKA -- 9.5.8 AutoGluon Tabular -- 9.5.9 FLAML -- 9.5.10 Ludwig -- 9.6 Types of AutoML Approaches -- 9.6.1 Fully Automated -- 9.6.2 Human-in-the-Loop -- 9.6.3 Model Assisted -- 9.7 Benefits of AutoML -- 9.8 Challenges and Limitations -- 9.9 Conclusion -- References -- Chapter 10 Plant Disease Identification Using Extended-EfficientNet Deep Learning Model in Smart Farming -- 10.1 Introduction -- 10.1.1 Obstacles in the Agricultural Sector -- 10.1.1.1 Soil Erosion -- 10.1.1.2 Absence of High-Quality Seeds -- 10.1.1.3 Lack of Contemporary Farming Machinery -- 10.1.2 Challenges of AI in Agriculture -- 10.1.3 Existing Plant Disease Identification Methods -- 10.2 Literature Review -- 10.3 Materials and Methods -- 10.3.1 Dataset -- 10.3.2 Existing CNN Models -- 10.3.2.1 AlexNet -- 10.3.2.2 VGG16 -- 10.3.2.3 ResNet50 -- 10.3.2.4 Inception V3 -- 10.4 Methodology-E-ENet -- 10.4.1 Localization of the Leaf -- 10.4.2 Segmentation of Leaf Image -- 10.4.3 The Diseased Leaf Identification -- 10.5 Experimental Analysis -- 10.5.1 The Acquisition of Data -- 10.5.2 The Parameter Setup -- 10.5.2.1 The Configuration of Parameters for Leaf Localization -- 10.5.2.2 The Configuration of Parameters for Leaf Segmentation -- 10.5.2.3 The Configuration of Parameters for Leaf Retrieval -- 10.6 Results -- 10.6.1 The Leaf Localization Outcome -- 10.6.2 The Outcomes of Leaf Segmentation -- 10.6.3 The Result of Disease Identification -- 10.7 Comparative Test -- 10.8 Summary -- References -- Chapter 11 AutoML-Driven Deep Learning for Fake Currency Recognition -- 11.1 Introduction -- 11.2 Literature Review -- 11.2.1 Scope -- 11.2.2 Objectives -- 11.3 Proposed System -- 11.4 Methodology -- 11.5 Convolutional Neural Network -- 11.6 Analysis Modeling -- 11.6.1 Behavioral Modeling -- 11.7 Software Testing.
11.7.1 Types of Testing -- 11.7.2 Test Cases -- 11.8 Results and Discussions -- 11.9 Conclusion -- References -- Chapter 12 Blockchain and Automated Machine Learning-Based Advancements for Banking and Financial Sectors -- 12.1 Introduction -- 12.2 Understanding Blockchain and AutoML -- 12.3 Need of Blockchain -- 12.4 Synergies Between Blockchain and AutoML -- 12.5 Applications in Banking and Finance -- 12.6 Applications of AutoML in Industries -- 12.7 Case Studies and Real-World Applications -- 12.8 Blockchain in Finance -- 12.9 Real-World Examples and Case Studies -- 12.10 Benefits and Challenges -- 12.11 Discussion -- 12.12 Limitations -- 12.13 Recommendations for Implementation -- 12.14 Ethical Considerations and Responsible AI -- 12.15 Future Directions and Emerging Trends -- 12.16 Future Scope -- 12.17 Conclusion -- References -- Chapter 13 Advances in Automated Machine Learning for Precision Healthcare and Biomedical Discoveries -- 13.1 Introduction -- 13.1.1 Some of the Recent Publications and their Findings -- 13.2 Current Day Usage of AI -- 13.2.1 Deep Learning and Neural Networks -- 13.2.2 Natural Language Processing (NLP) -- 13.2.2.1 Clinical Documentation -- 13.2.2.2 Disease Prediction -- 13.2.2.3 Chatbots and Virtual Assistants -- 13.2.2.4 Report Analysis -- 13.2.3 Automation -- 13.2.3.1 Appointment Scheduling -- 13.2.3.2 Medication Dispensary -- 13.2.3.3 Robotic Surgeries -- 13.2.3.4

Inventory Management -- 13.3 Data Management and Security in Healthcare AI -- 13.3.1 Data Acquisition and Storage -- 13.3.2 Data Processing and Analysis -- 13.3.3 Data Protection and Privacy -- 13.3.4 Balancing Technological Advancements with Data Governance -- 13.3.5 The Evolving Role of AI in Data Security -- 13.3.6 Continuous Education in Data Management and AI -- 13.3.7 Preparing for the Future of Healthcare AI and Data Management.
13.4 Challenges in Integrating AI into Healthcare Systems.

Sommario/riassunto

The book provides a comprehensive understanding of Automated Machine Learning's transformative potential across various industries, empowering users to seamlessly implement advanced machine learning solutions without needing extensive expertise. Automated Machine Learning (AutoML) is a process to automate the responsibilities of machine learning concepts for real-world problems. The AutoML process is comprised of all steps, beginning with a raw dataset and concluding with the construction of a machine learning model for deployment. The purpose of AutoML is to allow non-experts to work with machine learning models and techniques without requiring much knowledge in machine learning. This advancement enables data scientists to produce the easiest solutions and most accurate results within a short timeframe, allowing them to outperform normal machine learning models. Meta-learning, neural network architecture, and hyperparameter optimization, are applied based on AutoML. Automated Machine Learning and Industrial Applications offers an overview of the basic architecture, evolution, and applications of AutoML. Potential applications in healthcare, banking, agriculture, aerospace, and security are discussed in terms of their frameworks, implementation, and evaluation. This book also explores the AutoML ecosystem, its integration with blockchain, and various open-source tools available on the AutoML platform. It serves as a practical guide for engineers and data scientists, offering valuable insights for decision-makers looking to integrate machine learning into their workflows. Readers will find the book: Aims to explore current trends such as augmented reality, virtual reality, blockchain, open-source platforms, and Industry 4.0; Serves as an effective guide for professionals, researchers, industrialists, data scientists, and application developers; Explores technologies such as IoT, blockchain, artificial intelligence, and robotics, serving as a core guide for undergraduate and postgraduate students. Audience Data and computer scientists, research scholars, professionals, and industrialists interested in technology for Industry 4.0 applications.