1. Record Nr. UNINA9910920924803321 Autore Singh Rajesh Titolo Al in Disease Detection: Advancements and Applications Pubbl/distr/stampa Newark:,: John Wiley & Sons, Incorporated,, 2025 ©2025 **ISBN** 9781394278671 1394278675 9781394278688 1394278683 Edizione [1st ed.] Descrizione fisica 1 online resource (403 pages) Altri autori (Persone) GehlotAnita RathourNavjot Vaseem AkramShaik Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Nota di contenuto Cover -- Series Page -- Title Page -- Copyright Page -- Contents --About the Editors -- List of Contributors -- Preface --Acknowledgments -- Chapter 1 Introduction to AI in Disease Detection - An Overview of the Use of AI in Detecting Diseases, Including the Benefits and Limitations of the Technology -- Introduction --Objectives -- Literature Review -- Benefits of AI in Disease Detection -- Limitations of AI in Disease Detection -- AI Techniques in Disease Detection -- Supervised Learning for Disease Diagnosis --Unsupervised Learning in Healthcare -- Deep Learning and Convolutional Neural Networks (CNNs) -- Al in Medical Imaging and Radiology -- Applications of AI in Disease Detection -- Oncology: Cancer Detection and Diagnosis -- Cardiology: Predicting Cardiovascular Diseases -- Neurology: Early Detection of Neurological Disorders -- Infectious Diseases: Al in Epidemic and Pandemic Management -- Methodology -- Data Collection and Preprocessing --Multimodal Fusion Techniques -- Transfer Learning for Disease

Detection -- Explainable AI (XAI) Techniques -- Federated Learning Framework -- Clinical Validation and Adoption Studies -- Continuous

Monitoring and Early Warning Systems -- Results and Analysis -- Analysis -- Performance Evaluation for the Techniques of Multimodal Fusion -- Assessment of Transfer Learning for Disease Detection -- Effectiveness of Explainable AI Techniques -- Privacy-Preserving Federated Learning-based Collaborative Model Training -- Performance of Continuous Monitoring and Early Warning Systems -- Case Study: AI in Disease Detection -- Development and Training -- Testing and Validation -- Deployment and Integration -- Conclusion -- Future Scope -- References -- Chapter 2 Explanation of Machine Learning Algorithms Used in Disease Detection, Such as Decision Trees and Neural Networks -- Introduction.

The Silent Guardian: Machine Learning's Stealthy Rise in Disease Detection -- Beyond the Usual Suspects: A Look at Emerging Innovations -- The Ethical Symphony: Balancing Innovation with Human Oversight -- Objectives -- Unveiling Hidden Patterns - Feature Engineering -- Innovation Spotlight: Active Feature Acquisition (AFA) --Limitations and Advantages of ML Algorithms for Disease Detection --Advantages of Machine Learning Algorithms for Disease Detection --Limitations of Machine Learning Algorithms for Disease Detection --Literature Review -- The Familiar Melodies: Established ML Techniques and Their Strengths -- The Rise of the Deep Learning Chorus: Innovation on the Horizon -- Breaking New Ground: Unveiling Unique Innovations and Addressing Challenges -- The Well-Honed Orchestra: Established Techniques Take Center Stage -- Beyond the Familiar Melodies: Deep Learning Takes the Stage -- Collaboration and Innovation Lead the Way -- Methodology -- Conventional ML Methods for Disease Detection -- Beyond the Established Melodies: Innovation Takes Center Stage -- Results and Analysis -- The Familiar Melody: Established Methodologies -- The Disruptive Score: Unveiling New Innovations -- The Human Touch: Ethical Considerations and Explainability -- Conclusions and Future Scope -- The Evolving Maestro: Al Orchestration Beyond Established Methods -- Human-Machine Duet: Collaboration for a Healthier Future -- References --Chapter 3 Natural Language Processing (NLP) in Disease Detection - A Discussion of How NLP Techniques Can Be Used to Analyze and Classify Medical Text Data for Disease Diagnosis -- Introduction -- Objectives -- Early Infection Location through Phonetic Fingerprints -- Estimation Examination for All-encompassing Healthcare -- Social Media Reconnaissance for Disease Outbreaks.

Custom-fitted Medication through Personalized Content Investigation -- Precise Medication with Clinical Trial Content Mining -- Breaking Down Language Boundaries for Worldwide Wellbeing -- Human-Machine Collaboration for Making Strides -- Advantages and Limitations of Natural Language Processing in Disease Detection --Advantages of NLP in Disease Detection -- Limitations of NLP in Disease Detection -- Literature Review -- From Content to Determination: Revealing Etymological Fingerprints -- Past Watchwords: Capturing the Subtlety of Free-Text Information --Control of Expansive Language Models: A New Frontier -- Breaking Down Language Obstructions for Worldwide -- Toward a Collaborative Future: Human-Machine Association -- Logical AI -- Past Content: Multimodal Infection Discovery with NLP and Imaging Information --Methodology -- Information Procurement and Preprocessing: Building the Establishment -- Content Explanation: Labeling the Story --Feature Designing: Extricating Important Signals -- Show Determination and Preparing: Choosing the Right Tool for the Work --Demonstrate Assessment and Refinement: Guaranteeing Exactness and Belief -- Integration and Arrangement: Putting NLP to Work --

Results and Analysis -- Current Achievements: A Glimpse into the Possible -- Unveiling New Frontiers: Innovative Approaches for the Future -- Challenges and Considerations: Navigating the Road Ahead -- Case Study of NLP in Disease Detection -- Conclusions and Future Scope -- Charting the Course: Unveiling New Frontiers in NLP -- A Collaborative Future: Working Together for a Healthier Tomorrow -- Enhancing EHR Analysis -- Personalized Pharmaceutical -- Integration with AI and Machine Learning -- Expansion into New Medical Fields -- Upgrading Persistent Engagement -- Ethical and Protection Contemplations -- References.

Chapter 4 Computer Vision for Disease Detection - An Overview of How Computer Vision Techniques Can Be Used to Detect Diseases in Medical Images, Such as X-rays and MRIs -- Introduction -- Objectives --Improved Early Disease Detection -- Improve Diagnostic Accuracy --Developing Transfer Learning Models for Medical Imaging --Explainability in Artificial Intelligence Applied to Medical Imaging --Building Computer-Vision-Based Real-Time Disease Diagnostics Systems -- Integration of Multimodal Data for Comprehensive Diagnosis -- Literature Review -- Improving Early Detection and Diagnostic Accuracy -- Switch Studying and Artificial Records Generation -- Explainable AI and Real-Time Detection Structures --Multimodal Statistics Integration -- Innovations in Precise Disease Detection -- Advanced Deep Learning Strategies -- Statistics Augmentation and Synthesis -- Explainable AI for Trust and Transparency -- Real-Time Diagnostic Systems -- Integration of Multimodal Insights -- Disease-specific Innovations -- Benefits of Al in Disease Detection -- Limitations of AI in Disease Detection --Methodology -- Records Series and Preprocessing -- Version Improvement -- Real-Time Processing and Deployment -- Multimodal Records Integration -- Continuous Mastering and Development --Results and Analysis -- Diagnostic Accuracy -- Efficiency and Pace --Explainability and Agreement -- Multimodal Statistics Integration --Key Improvements -- Continuous Learning and Variation -- Medical Integration and Impact -- Key Improvements -- Conclusion and Future Scope -- References -- Chapter 5 Deep Learning for Disease Detection - A Deep Dive into Deep Learning Techniques Such as Convolutional Neural Networks (CNNs) and Their Use in Disease Detection --Introduction -- Objectives -- Literature Review -- Integration of Multimodal Information.

Switch Learning for Better Model Training -- Explainable AI Techniques for CNNs -- Records Augmentation and Synthesis Techniques --Fundamentals of Deep Learning -- CNNs in Medical Imaging -- Image Processing for Disease Detection -- Methodology -- Convolutional Neural Networks: A Top-level View -- Multiscale Convolutional Layers -- Attention Mechanisms -- Transfer Learning with Pretrained Models -- Generative Adversarial Networks (GANs) for Statistics Augmentation -- Self-Supervised Learning -- Results and Analysis -- Accuracy and Performance -- Enhanced Diagnostic Accuracy -- Sensitivity and Specificity -- Speed and Efficiency -- Reliability and Consistency --Effects -- Multiscale Convolutional Layers -- Attention Mechanisms --Switch Learning with Pretrained Models -- GANs for Statistics Augmentation -- Self-SupervisedLearning -- Improved Diagnostic Accuracy and Performance -- Reduced Dependence on Massive Labeled Datasets -- Better Version Robustness and Generalization -- Scalability and Flexibility -- Innovations and Future Instructions -- Multimodal Gaining Knowledge -- Federated Learning for Privateness-RetainingAl -- Explainable AI (XAI) for Stepped Forward Interpretability --Integration with Wearable Devices -- Real-TimeAdaptive Learning --

Conclusion and Future Scope -- Multimodal Deep Learning Integration -- Federated Learning for Stronger Privacy -- Explainable AI (XAI) for Transparency -- Wearable Generation AI and Continuous Monitoring -- Adaptive Learning and Real-Time Model Updating -- Personalized Remedy and Predictive Analytics -- Collaborative AI Systems -- Stronger Data Augmentation Techniques -- AI-driven Clinical Trials and Research -- International Health and AI-driven Disorder Surveillance -- References.

Chapter 6 Applications of AI in Cardiovascular Disease Detection - A Review of the Specific Ways in which AI Is Being Used to Detect and Diagnose Cardiovascular Diseases.