

1. Record Nr.	UNINA9910861045203321
Autore	Bajaj Varun
Titolo	High Performance Computing for Intelligent Medical Systems
Pubbl/distr/stampa	Bristol : , : Institute of Physics Publishing, , 2021 ©2021
ISBN	0-7503-4545-4
Edizione	[1st ed.]
Descrizione fisica	1 online resource (323 pages)
Collana	IOP Ebooks Series
Altri autori (Persone)	AnsariIrrshad Ahmad
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Acknowledgements -- Editors biographies -- Varun Bajaj -- Irshad Ahmad Ansari -- Contributors biographies -- Ms Athena Abrishamchi -- Fatame Bafande -- Hussain Ahmed Choudhury -- Sengul Dogan -- Vandana Dubey -- Fatih Ertam -- Jamal Esmaelpoor -- Harsh Goud -- Kapil Gupta -- Lalita Gupta -- Smith K Khare -- Rajesh Kumar -- Wahengbam Kanan Kumar -- Gaurav Makwana -- Miguel Ángel Mañanas -- Hamid Reza Marateb -- Arezoo Mirshamsi -- Mohammad Reza Mohebbian -- Mohammad Hassan Moradi -- Kishorjit Nongmeikapam -- Saurabh Pal -- Antti Rissanen -- Marjo Rissanen -- Kalle Saastamoinen -- Zahra Momayez Sanat -- Prakash Chandra Sharma -- Mehdi Shirzadi -- Aheibam Dinamani Singh -- Mithlesh Prasad Singh -- Nidul Sinha -- Abdulhamit Subasi -- Turker Tuncer -- Amit Kumar Verma -- Dhyan Chandra Yadav -- Ram Narayan Yadav -- Shadi Zamani -- Chapter 1 Automatic detection of hypertension by flexible analytic wavelet transform using electrocardiogram signals -- 1.1 Introduction -- 1.1.1 Various intervals of ECG -- 1.1.2 Related work -- 1.2 Methodology -- 1.2.1 Dataset -- 1.2.2 Flexible analytic wavelet transform -- 1.2.3 Feature extraction -- 1.2.4 Classification techniques -- 1.2.5 Performance parameters -- 1.3 Results -- 1.4 Conclusion -- References -- Chapter 2 Computational intelligence in surface electromyogram signal classification -- 2.1 Introduction -- 2.2 Computational intelligence in biomedical signal processing -- 2.3 Background -- 2.3.1 Discrete cosine transform -- 2.3.2 Fast Fourier transform -- 2.3.3 Singular value decomposition --

2.3.4 Ternary pattern -- 2.3.5 Support vector machine -- 2.3.6 Linear discriminant analysis -- 2.3.7 KNN -- 2.3.8 Artificial neural network -- 2.4 Spider network -- 2.4.1 Pre-processing -- 2.4.2 Feature extraction -- 2.4.3 Feature reduction -- 2.4.4 Feature concatenation -- 2.4.5 Classification.

2.5 Results and discussions -- 2.5.1 Dataset -- 2.5.2 Experimental results -- 2.5.3 Discussion -- 2.6 Conclusions and suggestions -- References -- Chapter 3 Analysis of IoT interventions to solve voice pathologies challenges -- 3.1 Introduction -- 3.1.1 Pathology assessment -- 3.1.2 Internet of things in voice pathology -- 3.2 Electroglottography -- 3.2.1 Quantitative analysis -- 3.3 Voice pathology datasets -- 3.3.1 Voice ICar fEDerico II (VOICED) -- 3.3.2 Massachusetts eye and ear infirmary -- 3.3.3 Saarbruecken Voice Database -- 3.3.4 Arabic voice pathology database -- 3.4 Acoustic speech features with machine learning for voice pathology classification -- 3.4.1 Feature extraction techniques -- 3.4.2 Voice pathology analysis and detection techniques -- 3.5 Discussion and conclusion -- References -- Chapter 4 Deep learning for cuffless blood pressure monitoring -- 4.1 Introduction -- 4.2 Physiological models -- 4.3 Data source -- 4.3.1 Preprocessing procedures -- 4.4 Deep learning models for blood pressure monitoring -- 4.4.1 LSTM model -- 4.4.2 PCA-LSTM model -- 4.4.3 Convolutional neural network model -- 4.4.4 CNN-LSTM model -- 4.5 Discussion -- 4.5.1 Comparison with other methods -- 4.6 Conclusion -- References -- Chapter 5 Reliability of machine learning methods for diagnosis and prognosis during the COVID-19 pandemic: a comprehensive critical review -- 5.1 Introduction -- 5.2 Methods -- 5.2.1 January-March -- 5.2.2 April-June -- 5.2.3 July-September -- 5.2.4 October 2020 to February 2021 -- 5.2.5 Machine learning methods -- 5.2.6 Critical issues -- 5.3 Conclusion and future scope -- References -- Chapter 6 Forecasting confirmed cases of Corona patients in India using regression and Gaussian analysis -- 6.1 Introduction -- 6.2 Regression analysis in machine learning -- 6.3 Related work -- 6.4 Methodology -- 6.4.1 Data description -- 6.5 Results.

6.6 Discussion -- 6.7 Conclusion -- Acknowledgments -- References -- Chapter 7 A model for advanced patient feedback procedures in diagnostics -- 7.1 Introduction -- 7.2 Focus on diagnostics -- 7.2.1 Diagnostic error as a concept -- 7.2.2 Diagnostic errors in healthcare -- 7.2.3 Common reasons for diagnostic failures -- 7.2.4 Preventing diagnostic errors in cooperation with patients -- 7.3 Diagnostics and safety challenges in healthcare -- 7.3.1 Patient safety and equity challenges -- 7.3.2 Enhanced patient safety with rational cost control policy -- 7.4 Importance of patient feedback in the diagnostics phase -- 7.4.1 Need for timely feedback -- 7.4.2 The role of timely feedback -- 7.5 The challenges of diagnostics-centered clients' feedback -- 7.6 Enhancing technology acceptance in system development -- 7.7 Phases of diagnostics and the requirements for doctors -- 7.7.1 Requirements for competence and compassion -- 7.7.2 Diagnostic process from the view of doctors -- 7.7.3 Diagnostic process from the view of patients -- 7.8 A model for instant patient feedback -- 7.8.1 General principles -- 7.8.2 Structure of the model -- 7.8.3 Patient management with the model -- 7.8.4 Meaning of the fixed format phase of the model-phase 1 -- 7.8.5 Meaning and management of the free format phase-phase 2 -- 7.8.6 Clients' opinions of the feedback delivery system-phase 3 -- 7.9 Client feedback as a translational development challenge -- 7.9.1 Enhancing process synergy in organizations -- 7.9.2 Maturing and validating patient-targeted feedback systems -- 7.10 Conclusion -- References -- Chapter 8 Soft computing techniques for efficient

processing of large medical data -- 8.1 Introduction -- 8.2 Understanding the concept: video compression -- 8.3 Image compression standards -- 8.3.1 JPEG -- 8.3.2 JPEG2000 -- 8.3.3 JPEG-LS -- 8.3.4 JPEG-XR -- 8.3.5 H.265. 8.3.6 Types of coding and frames -- 8.4 Motion estimation and the necessity of it in video coding? -- 8.4.1 Forward and backward motion estimation -- 8.4.2 Block matching concept -- 8.5 What is soft computing: techniques and differences -- 8.6 Standard techniques for motion estimation -- 8.7 Soft computing techniques for motion estimation -- 8.8 Conceptual terms used in different SC techniques -- 8.8.1 Chromosomes and genes -- 8.8.2 Chromosome representation -- 8.8.3 Cross-over -- 8.8.4 Mutation -- 8.8.5 Weighting function and PBME -- 8.9 Some well-established soft computing based BMA -- 8.9.1 Genetic algorithm-BMA -- 8.9.2 Inter-block/inter-frame fuzzy search algorithm -- 8.9.3 Basic block-matching using particle swarm optimization -- 8.9.4 Harmony search block matching algorithm -- 8.9.5 Cat swarm optimization (CSO-BMA) -- 8.9.6 CUCKOO search based BMA (CS-BMA) -- 8.9.7 The ABC-BM algorithm -- 8.9.8 ABC-DE -- 8.9.9 HS-DE based BMA -- 8.9.10 'Deterministically starting-GA' (GADet) -- 8.9.11 Enhanced Grey-wolf optimizer-BMA (EGWO-BMA) -- 8.9.12 Chessboard search pattern strategy -- 8.10 Results and discussion -- Acknowledgment -- References -- Chapter 9 A comparison of Parkinson's disease prediction using ensemble data mining techniques with features selection methods -- 9.1 Introduction -- 9.2 Related work -- 9.3 Methodology -- 9.3.1 Data description -- 9.3.2 Whisker plotting -- 9.3.3 Histogram plotting -- 9.4 Algorithms description -- 9.4.1 Decision tree -- 9.4.2 Naïve Bayes -- 9.4.3 Random forest -- 9.4.4 Extra tree -- 9.4.5 Bagging ensemble method -- 9.4.6 Features selection method in Parkinson's disease -- 9.5 Results -- 9.5.1 Evaluation of result after prediction on Parkinson's dataset -- 9.5.2 Result of features importance methods -- 9.5.3 Chi-square test -- 9.5.4 Extra tree -- 9.5.5 Heat map. 9.5.6 Evaluation of results after features selection -- 9.6 Discussion -- 9.7 Conclusion -- Acknowledgments -- References -- Chapter 10 A comparative analysis of image enhancement techniques for detection of microcalcification in screening mammogram -- 10.1 Introduction -- 10.2 Image enhancement in spatial domain -- 10.2.1 Histogram modeling -- 10.2.2 Histogram equalization -- 10.2.3 Histogram matching -- 10.2.4 Averaging filter -- 10.2.5 Gaussian filter -- 10.2.6 Median filter -- 10.3 Image enhancement in frequency domain -- 10.3.1 Butterworth filtering -- 10.3.2 Gaussian low-pass filter -- 10.3.3 Homomorphic filtering -- 10.3.4 Discrete wavelet transform -- 10.4 Convolutional neural network -- 10.5 Evaluation criteria -- 10.5.1 Mean square error -- 10.5.2 Peak signal-to-noise ratio -- 10.5.3 SNR -- 10.5.4 Mean -- 10.5.5 Variance -- 10.6 Results and discussion -- 10.7 Conclusion -- References -- Chapter 11 Computational intelligence for eye disease detection -- 11.1 Introduction -- 11.2 Anatomy of the eye -- 11.2.1 The cornea -- 11.2.2 The human retina -- 11.3 Retinal diseases -- 11.3.1 Retinal tear -- 11.3.2 Diabetic retinopathy -- 11.3.3 Macula hole -- 11.3.4 Degeneration of the macula -- 11.3.5 Disorders of the optic nerve -- 11.3.6 Glaucoma -- 11.3.7 Diabetic macular edema -- 11.3.8 Retinopathy of prematurity -- 11.4 History of retinal imaging -- 11.5 Current status of retinal analysis -- 11.5.1 Fundus imaging -- 11.5.2 Optical coherence tomography -- 11.6 Disease specific analysis of retinal images -- 11.6.1 Early detection of retinal disease from fundus photography -- 11.6.2 Early detection of systemic disease from fundus photography -- 11.6.3 3-Dimensional OCT and retinal diseases-image guided therapy

-- 11.7 Fundus image analysis -- 11.7.1 Glaucoma detection using retinal imaging -- 11.7.2 Dementia detection using retinal imaging. 11.7.3 Heart diseases detection using retinal imaging.

Sommario/riassunto

The interface of high-performance computing, computational intelligence and medical science creates intelligent medical systems which offer significant improvements in the quality of life and efficacy of clinical treatment. This book reviews advances and applications of high-performance computing for medical applications.
