

---

# Contents

## Part I Big Data Analytics for Precision Medicine

<b>Hybrid Hierarchical Clustering Algorithm Used for Large Datasets: A Pilot Study on Long-Term Sleep Data</b> . . . . .	3
V. Gerla, M. Murgas, A. Mladek, E. Saifutdinova, M. Macas, and L. Lhotska	
<b>Epileptic Seizure Prediction with Stacked Auto-encoders: Lessons from the Evaluation on a Large and Collaborative Database</b> . . . . .	9
R. Barata, B. Ribeiro, A. Dourado, and C. A. Teixeira	
<b>Deep Learning Techniques on Sparsely Sampled Multichannel Data—Identify Deterioration in ICU Patients</b> . . . . .	15
A. Chytas, K. Vaporidi, Y. Surlatzis, D. Georgopoulos, N. Maglaveras, and I. Chouvarda	
<b>Convolutional Neural Networks for Early Seizure Alert System</b> . . . . .	19
T. Ieřmantas and R. Alzbutas	
<b>Prediction of Cardiac Arrest in Intensive Care Patients Through Machine Learning</b> . . . . .	25
E. Akrivos, V. Papaioannou, N. Maglaveras, and I. Chouvarda	
<b>Part II Scientific Challenge—Lung Sounds Analysis</b>	
<b>A Respiratory Sound Database for the Development of Automated Classification</b> . . . . .	33
B. M. Rocha, D. Filos, L. Mendes, I. Vogiatzis, E. Perantoni, E. Kaimakamis, P. Natsiavas, A. Oliveira, C. Jácome, A. Marques, R. P. Paiva, I. Chouvarda, P. Carvalho, and N. Maglaveras	
<b>Hidden Markov Model Based Respiratory Sound Classification</b> . . . . .	39
N. Jakovljević and T. Lončar-Turukalo	
<b>An Automated Lung Sound Preprocessing and Classification System Based OnSpectral Analysis Methods</b> . . . . .	45
Gorkem Serbes, Sezer Ulukaya, and Yasemin P. Kahya	
<b>Detection of Cough and Adventitious Respiratory Sounds in Audio Recordings by Internal Sound Analysis</b> . . . . .	51
B. M. Rocha, L. Mendes, I. Chouvarda, P. Carvalho, and R. P. Paiva	

### Part III eHealth Systems, Services and Cloud Computing

<b>A Content-Aware Analytics Framework for Open Health Data</b> . . . . .	59
L. Koumakis, H. Kondylakis, D. G. Katehakis, G. Iatraki, P. Argyropaidas, M. Hatzimina, and K. Marias	
<b>Towards Harmonized Data Processing in SMBG</b> . . . . .	65
Sara Zulj, Goran Seketa, and Ratko Magjarevic	
<b>Notarization of Knowledge Retrieval from Biomedical Repositories Using Blockchain Technology</b> . . . . .	69
P. Mytis-Gkometh, G. Drosatos, P. S. Efraimidis, and E. Kaldoudi	
<b>Gap Analysis for Information Security in Interoperable Solutions at a Systemic Level: The KONFIDO Approach</b> . . . . .	75
J. Rasmussen, P. Natsiavas, K. Votis, K. Moschou, P. Campegiani, L. Coppolino, I. Cano, D. Mari, G. Faiella, O. Stan, O. Abdelrahman, M. Nalin, I. Baroni, M. Voss-Knude, V. A. Vella, E. Grivas, C. Mesaritakis, J. Dumortier, J. Petersen, D. Tzouvaras, L. Romano, I. Komnios, and V. Koutkias	
<b>Identification of Barriers and Facilitators for eHealth Acceptance: The KONFIDO Study</b> . . . . .	81
P. Natsiavas, C. Kakalou, K. Votis, D. Tzouvaras, N. Maglaveras, I. Komnios, and V. Koutkias	
<b>A Personalized Cloud-Based Platform for AAL Support to Cognitively Impaired Elderly People</b> . . . . .	87
Stefanos Stavrotheodoros, Nikolaos Kaklanis, and Dimitrios Tzouvaras	
<b>Enhanced Healthcare System Based on Mobile Communication</b> . . . . .	93
Cheng-Huei Yang, Tsung-Che Wu, and Hsiu-Chen Huang	
<b>Experience of Using the WELCOME Remote Monitoring System on Patients with COPD and Comorbidities</b> . . . . .	97
E. Kaimakamis, E. Perantoni, E. Serasli, V. Kilintzis, I. Chouvarda, R. Kayyali, S. Nabhani-Gebara, J. Chang, R. Siva, R. Hibbert, N. Philips, D. Karamitros, A. Raptopoulos, I. Frerichs, J. Wacker, and N. Maglaveras	
<b>Part IV Biosignals and Biomarkers</b>	
<b>Adipose Tissue as a Biomarker in Data Mining Predictive Models of Metabolic Pathophysiologies</b> . . . . .	105
O. Tsave, I. Kavakiotis, I. Vlahavas, and A. Salifoglou	
<b>Portable Near-Infrared Spectroscopy for Detecting Peripheral Arterial Occlusion</b> . . . . .	109
W.-C. Lu, S.-H. Lu, M.-F. Chen, T.-C. Fu, K.-P. Lin, and C.-L. Tsai	
<b>Physiological Monitoring of Cold-Air Stimulated Rhinitis</b> . . . . .	115
M.-S. Jhuang, C.-M. Chen, S.-H. Lu, M.-F. Chen, K.-P. Lin, and C.-L. Tsai	

<b>Association Between SpO<sub>2</sub> Signal Characteristics and Sleep Architecture with Insulin Resistance in Patients with Obstructive Sleep Apnea Syndrome . . .</b>	119
E. Perantoni, P. Steiropoulos, D. Filos, N. Maglaveras, K. Nikolaou, and I. Chouvarda	
<b>Part V Biosignal Analysis Methods</b>	
<b>Preprocessing and Filtration Techniques of BSPM Signals in a Small-Scale Study . . . . .</b>	127
M. Hrachovina, L. Lhotská, and M. Huptych	
<b>Blood Vessel Segmentation from Microcirculation Images . . . . .</b>	133
Bea Lyn M. Virtudazo, Jimmy Hasugian, Wen-Chen Lin, Mei-Fen Chen, and Kang-Ping Lin	
<b>Active Learning for Semi-automated Sleep Scoring . . . . .</b>	139
N. Grimova, M. Macas, and V. Gerla	
<b>Human Fall Detection from Acceleration Measurements Using a Recurrent Neural Network . . . . .</b>	145
T. Theodoridis, V. Solachidis, N. Vretos, and P. Daras	
<b>Optimal Threshold Selection for Acceleration-Based Fall Detection . . . . .</b>	151
G. Šeketa, J. Vugrin, and I. Lacković	
<b>Camera Based Real Time Fall Detection Using Pattern Classification. . . . .</b>	157
M. Macaš, S. Lesoin, and A. Périn	
<b>Part VI Machine Learning and Predictive Models in Medicine</b>	
<b>Epileptic Seizures Classification Based on Long-Term EEG Signal Wavelet Analysis. . . . .</b>	165
K. D. Tzamourta, A. T. Tzallas, N. Giannakeas, L. G. Astrakas, D. G. Tsalikakis, and M. G. Tsipouras	
<b>Heartrate Variability Comparison Between Electrocardiogram, Photoplethysmogram and Ballistic Pulse Waveforms at Fiducial Points . . . . .</b>	171
G. M. W. Janjua, R. Hadia, D. Guldenring, D. D. Finlay, and J. A. D. McLaughlin	
<b>Wavelet ECG Analysis in Time-Frequency Domain of the QRS-Complex in Individuals with Left Bundle Branch Block . . . . .</b>	179
Kalliopi Papatoma, Stavros Chatzimiltiadis, Nikolaos Maglaveras, Ioanna Chouvarda, Efstratios Theofilogiannakos, Dimitrios Konstantinou, and Vassilios Vassilikos	
<b>Adaboost Classifier with Dimensionality Reduction Techniques for Epilepsy Classification from EEG . . . . .</b>	185
S. K. Prabhakar and H. Rajaguru	
<b>Performance Analysis of Factor Analysis and Isomap with Hybrid ABC-PSO Classifier for Epilepsy Classification. . . . .</b>	191
S. K. Prabhakar and H. Rajaguru	

<b>Performance Analysis of Breast Cancer Classification with Softmax Discriminant Classifier and Linear Discriminant Analysis . . . . .</b>	197
S. K. Prabhakar and H. Rajaguru	
<b>Part VII Behavioural Informatics and Connected Health Technologies</b>	
<b>Emotion Recognition from Haptic Touch on Android Device Screens. . . . .</b>	205
C. Maramis, L. Stefanopoulos, I. Chouvarda, and N. Maglaveras	
<b>Objective Smoking: Towards Smoking Detection Using Smartwatch Sensors . . .</b>	211
C. Maramis, V. Kilintzis, P. Scholl, and I. Chouvarda	
<b>Towards Value Propositions for Persuasive Health and Wellbeing Applications . . . . .</b>	217
M. S. Haque, A. Arman, M. Kangas, T. Jämsä, and M. Isomursu	
<b>Parkinson’s Disease Patients Classification Based on a Motion Tracking Methodology. . . . .</b>	223
Eleftheria Polychronidou, Sofia Segkouli, Elias Kalamaras, Stavros Papadopoulos, Anastasios Drosou, Konstantinos Votis, Sevasti Bostantjopoulou, Zoe Katsarou, Charalambos Papaxanthis, Vassilia Hatzitaki, Panagiotis Moschonas, and Dimitrios Tzovaras	
<b>Patient Empowerment Through Summarization of Discussion Threads on Treatments in a Patient Self-help Forum . . . . .</b>	229
Sourabh Dandage, Johannes Huber, Atin Janki, Uli Niemann, Ruediger Pryss, Manfred Reichert, Steve Harrison, Markku Vessala, Winfried Schlee, Thomas Probst, and Myra Spiliopoulou	
<b>Part VIII e-Coaching and Patient Support for Physical Activity Promotion</b>	
<b>A Computer-Assisted System with Kinect Sensors and Wristband Heart Rate Monitors for Group Classes of Exercise-Based Rehabilitation . . . . .</b>	237
A. Triantafyllidis, D. Filos, R. Buys, J. Claes, V. Cornelissen, E. Kouidi, A. Chatzitofis, D. Zarpalas, P. Daras, I. Chouvarda, and N. Maglaveras	
<b>A Computerized System for Real-Time Exercise Performance Monitoring and e-Coaching Using Motion Capture Data . . . . .</b>	243
Anargyros Chatzitofis, Dimitris Zarpalas, and Petros Daras	
<b>Design of a Fully Automated Service to Generate an Individualized Exercise Rehabilitation Program for Adults with Congenital Heart Disease . . . .</b>	249
R. Buys and V. A. Cornelissen	
<b>Adherence to Physical Activity in Patients with Heart Disease: Types, Settings and Evaluation Instruments . . . . .</b>	255
K. Livitckaia, V. Koutkias, N. Maglaveras, E. Kouidi, M. van Gils, and I. Chouvarda	
<b>Training System Methodology Using ECG Signal . . . . .</b>	261
E. Butkeviciute, L. Bikulciene, and K. Poderiene	
<b>Author Index . . . . .</b>	267



<http://www.springer.com/978-981-10-7418-9>

Precision Medicine Powered by pHealth and Connected Health

ICBHI 2017, Thessaloniki, Greece, 18-21 November 2017

Maglaveras, N.; Chouvarda, I.; de Carvalho, P. (Eds.)

2018, XII, 269 p. 103 illus., Softcover

ISBN: 978-981-10-7418-9