

# Contents

## Part I ICT for Health Care

<b>The Role of ICT in the Italian Health Care System . . . . .</b>	<b>3</b>
Maurizio Ciaschini, Monica De Angelis, Andrea Monteriù, Rosita Pretaroli, Francesca Severini and Claudio Socci	
<b>A Non-Intrusive Model for the Collection and Analysis of Data, Feedback and Needs . . . . .</b>	<b>19</b>
Lorenza Lupini and Francesca Scocchera	
<b>Analyzing Environmental Conditions and Vital Signs to Increase Healthy Living . . . . .</b>	<b>27</b>
Ralf Seepold, Christoph Dermati, Artur Kostka, Lars Pfeil, Ralf Lange, Matthias Hermann and Benedikt Martinez	
<b>Preliminary Study of a Novel Shelving System for Nutrition Habits Measuring . . . . .</b>	<b>41</b>
Alessandro Freddi, Sauro Longhi, Andrea Monteriù, Davide Ortenzi and Mariorosario Prist	
<b>A Rule-Based Assistant System for Managing the Clothing Cycle . . . . .</b>	<b>51</b>
Thomas Walzer, Emre Yay and Natividad Martínez Madrid	

## Part II Embedded Systems for Biometric Data Acquisition

<b>State of Charge Monitor for Wireless Sensor Networks . . . . .</b>	<b>65</b>
Mirko Carloni, Rocco d'Aparo, Pierpaolo Scorrano, Berardo Naticchia and Massimo Conti	
<b>Development of an Algorithm and a Sensor to Monitor the Heart Rate by Volumetric Measurement Techniques. . . . .</b>	<b>79</b>
Jens Gansloser and Ralf Seepold	

<b>Piezoelectric Energy Harvesting on Running Shoes. . . . .</b>	<b>91</b>
Enrico Camilloni, Giuseppe DeMaso-Gentile, Cristiano Scavongelli, Simone Orcioni and Massimo Conti	
<b>Implementing Steganocryptography in Scanner and Angio-Scanner Medical Images. . . . .</b>	<b>109</b>
Indrit Enesi and Blerina Zanaj	
 <b>Part III Biometric Data in Automotive and Home Applications</b>	
<b>Stress-Aware Generation of Recommendations in a Driving System to Increase User Acceptance . . . . .</b>	<b>123</b>
Emre Yay and Natividad Martínez Madrid	
<b>Stress Map Based Information System for Increasing Road Safety . . . .</b>	<b>135</b>
Patrick Datko, Ralf Seepold and Natividad Martínez Madrid	
<b>An OpenCV Based Android Application for Drowsiness Detection on Mobile Devices . . . . .</b>	<b>145</b>
Laura Montanini, Ennio Gambi and Susanna Spinsante	
<b>Distributed Speech and Speaker Identification System for Personalized Domotic Control . . . . .</b>	<b>159</b>
Giorgio Biagetti, Paolo Crippa, Laura Falaschetti, Simone Orcioni and Claudio Turchetti	
 <b>Part IV Biometric Data Analysis of Cardiac Signals</b>	
<b>Surface EMG Fatigue Analysis by Means of Homomorphic Deconvolution. . . . .</b>	<b>173</b>
Giorgio Biagetti, Paolo Crippa, Simone Orcioni and Claudio Turchetti	
<b>sEMG-Based Evaluation of Muscle Recruitment Variability During Walking in Terms of Activation Length and Occurrence Frequency . . . . .</b>	<b>189</b>
A. Mengarelli, E. Maranesi, L. Burattini, S. Fioretti and F. Di Nardo	
<b>High Performance Dynamic Threshold Calibration for RR Interval Detection in a QRS Complex Using a Parallel Programing . . . . .</b>	<b>205</b>
Mohammed Rajab and Ralf Seepold	
<b>An Analog Front-End for Combined EMG/ECG Wireless Sensors . . . .</b>	<b>215</b>
Giorgio Biagetti, Paolo Crippa, Simone Orcioni and Claudio Turchetti	
<b>Stress Determent via QRS Complex Detection, Analysis and Pre-processing . . . . .</b>	<b>225</b>
Wilhelm Daniel Scherz, Juan Antonio Ortega, Ralf Seepold and Natividad Martínez Madrid	

<b>Health Monitoring in Sport Through Wearable Sensors:</b>	
<b>A Novel Approach Based on Heart-Rate Variability . . . . .</b>	<b>235</b>
E. Maranesi, M. Morettini, A. Agostinelli, C. Giuliani, F. Di Nardo and L. Burattini	
<b>A New Segmented-Beat Modulation Algorithm for Maternal ECG Estimation from Abdominal Recordings . . . . .</b>	<b>247</b>
A. Agostinelli, C. Giuliani, S. Fioretti, F. Di Nardo and L. Burattini	
<b>Part V Gait Analysis</b>	
<b>Webcam and Smartphone for the Measure of Spatial-Temporal Parameters of Gait for Treadmill Use . . . . .</b>	<b>261</b>
Vinicio Barone, F. Verdini, F. Di Nardo, E. Maranesi, L. Burattini and S. Fioretti	
<b>The Wireless Surface Electromyographic Technique for Supporting the Assessment of Fall Risk in Diabetic Neuropathic Patients . . . . .</b>	<b>273</b>
E. Maranesi, S. Fioretti, V. Barone, G.G. Ghetti, O. Mercante, R.A. Rabini, L. Burattini and F. Di Nardo	
<b>A Method for Computing the Functional Ambulation Profile Score by Stereophotogrammetric Data . . . . .</b>	<b>285</b>
E. Maranesi, M. Petrini, G.G. Ghetti, O. Mercante, V. Barone, L. Burattini, F. Di Nardo and S. Fioretti	
<b>Fall Detection Using Wearable Accelerometers and Smartphone . . . . .</b>	<b>299</b>
Luca Basili, Giuseppe DeMaso-Gentile, Cristiano Scavongelli, Simone Orcioni, Stefano Pirani and Massimo Conti	
<b>Step Length Estimation for Freezing of Gait Monitoring in Parkinsonian Patients . . . . .</b>	<b>313</b>
Lucia Pepa, Marco Rossini, Luca Spalazzi and Federica Verdini	

Mobile Networks for Biometric Data Analysis

Conti, M.; Martínez Madrid, N.; Seepold, R.; Orcioni, S.  
(Eds.)

2016, IX, 323 p. 160 illus., 104 illus. in color., Hardcover

ISBN: 978-3-319-39698-9