

# Contents

<b>Introduction to Large-Scale Distributed Computing in Smart Healthcare</b> .....	1
Assad Abbas, Samee U. Khan and Albert Y. Zomaya	
<b>Part I High Performance Computing and Large-Scale Healthcare Architectures</b>	
<b>Big Healthcare Data Analytics: Challenges and Applications</b> .....	11
Chonho Lee, Zhaojing Luo, Kee Yuan Ngiam, Meihui Zhang, Kaiping Zheng, Gang Chen, Beng Chin Ooi and Wei Luen James Yip	
<b>Process Streaming Healthcare Data with Adaptive MapReduce Framework</b> .....	43
Fan Zhang, Junwei Cao, Samee U. Khan, Keqin Li and Kai Hwang	
<b>High-Performance Monte Carlo Simulations for Photon Migration and Applications in Optical Brain Functional Imaging</b> .....	67
Fanny Nina-Paravecino, Leiming Yu, Qianqian Fang and David Kaeli	
<b>Building Automation and Control Systems for Healthcare in Smart Homes</b> .....	87
M. Frenken, J. Flessner and J. Hurka	
<b>Part II Data Quality and Large-Scale Machine Learning Models for Smart Healthcare</b>	
<b>Electronic Health Records: Benefits and Challenges for Data Quality</b> .....	123
Abdul Kader Saïod, Darelle van Greunen and Alida Veldsman	
<b>Large Scale Medical Data Mining for Accurate Diagnosis: A Blueprint</b> .....	157
Md. Sarwar Kamal, Nilanjan Dey and Amira S. Ashour	

<b>Machine Learning Models for Multidimensional Clinical Data . . . . .</b>	<b>177</b>
Christina Orphanidou and David Wong	
<b>Data Quality in Mobile Sensing Datasets for Pervasive Healthcare . . . .</b>	<b>217</b>
Netzahualcóyotl Hernández, Luis A. Castro, Jesús Favela, Layla Michán and Bert Arnrich	
 <b>Part III Internet-of-Things, Fog Computing, and m-Health</b>	
<b>Internet of Things Based E-health Systems: Ideas, Expectations and Concerns . . . . .</b>	<b>241</b>
Mirjana Maksimović and Vladimir Vujović	
<b>Fog Computing in Medical Internet-of-Things: Architecture, Implementation, and Applications . . . . .</b>	<b>281</b>
Harishchandra Dubey, Admir Monteiro, Nicholas Constant, Mohammadreza Abtahi, Debanjan Borthakur, Leslie Mahler, Yan Sun, Qing Yang, Umer Akbar and Kunal Mankodiya	
<b>Technologies and Practices: Mobile Healthcare Based on Medical Image Cloud and Big Data (in China). . . . .</b>	<b>323</b>
Jianzhong Hu, Weihong Huang and Yedong Huang	
<b>Large-Scale Innovations and Approaches for Community Healthcare Support in Developing Nations. . . . .</b>	<b>359</b>
Shah Jahan Miah	
 <b>Part IV Wearable Computing for Smart Healthcare</b>	
<b>Wearable Computers for Sign Language Recognition . . . . .</b>	<b>379</b>
Jian Wu and Roozbeh Jafari	
<b>Real-Time, Personalized Anomaly Detection in Streaming Data for Wearable Healthcare Devices. . . . .</b>	<b>403</b>
Bharadwaj Veeravalli, Chacko John Deepu and DuyHoa Ngo	
<b>Activity Recognition Based on Pattern Recognition of Myoelectric Signals for Rehabilitation . . . . .</b>	<b>427</b>
Oluwarotimi Williams Samuel, Peng Fang, Shixiong Chen, Yanjuan Geng and Guanglin Li	
<b>Infrequent Non-speech Gestural Activity Recognition Using Smart Jewelry: Challenges and Opportunities for Large-Scale Adaptation. . . .</b>	<b>443</b>
Mohammad Arif Ul Alam, Nirmalya Roy, Aryya Gangopadhyay and Elizabeth Galik	
<b>Smartphone Based Real-Time Health Monitoring and Intervention . . . .</b>	<b>473</b>
Daniel Aranki, Gregorij Kurillo and Ruzena Bajcsy	

<b>Exploiting Physiological Sensors and Biosignal Processing to Enhance Monitoring Care in Mental Health</b> . . . . .	515
Gaetano Valenza and Enzo Pasquale Scilingo	
 <b>Part V Resource Allocation, Quality of Service (QoS), and Context-Awareness in Smart Healthcare</b>	
<b>Resource Allocation in Body Area Networks for Energy Harvesting Healthcare Monitoring</b> . . . . .	553
Shiyang Leng and Aylin Yener	
<b>Medical-QoS Based Telemedicine Service Selection Using Analytic Hierarchy Process</b> . . . . .	589
Ali Hassan Sodhro, Faisal K. Shaikh, Sandeep Pirbhulal, Mir Muhammad Lodro and Madad Ali Shah	
<b>Development and Application of a Generic Methodology for the Construction of a Telemonitoring System</b> . . . . .	611
Amir Hajjam El Hassani, Amine Ahmed Benyahia, Emmanuel Andres, Samy Talha, Mohamed Hajjam El Hassani and Vincent Hilaire	
<b>Ontology-Based Contextual Information Gathering Tool for Collecting Patients Data Before, During and After a Digestive Surgery</b> . . . . .	623
Lamine Benmimoune, Amir Hajjam, Parisa Ghodous, Emmanuel Andres and Mohamed Hajjam	

Handbook of Large-Scale Distributed Computing in  
Smart Healthcare

Khan, S.U.; Zomaya, A.Y.; Abbas, A. (Eds.)

2017, XI, 635 p. 207 illus., Hardcover

ISBN: 978-3-319-58279-5