Preface

E-health field has a great potential. According to the World Health Organisation (WHO), e-health is the combined use of electronic communication and information technology in the health sector. Moreover, it enables a safer, higher quality, more equitable and sustainable health system. The book seeks to show interesting e-health experiences and applications around the world. It wants to take account of developments and trends that are taking place in the area of Medical Informatics and it offers a comprehensive and integrated approach to healthcare. The mission of the book is to be a fundamental source for the advancement of knowledge, application, and practice in the interdisciplinary areas of healthcare, e-health, m-health, u-health, sensors, biomedical engineering, and telemedicine.

Due to its grounding in research and theory evidence, this book is designed for use in graduate courses in health management, medicine, nursing, health professionals and medical informatics. The book can help to e-health contents, applications and interesting experiences. It is an important way to communicate e-health concepts.

The book will address innovative concepts and critical issues in the emerging field of e-health and it treats a range of services that are at the edge of medicine/healthcare and information technology. It is formed by 17 chapters. Chapter 1 addresses the problem of system design and data fusion technology over a bandwidth and energy constrained body sensor network. Compare with the traditional sensor network, miniaturization and low-power are more important to meet the requirements of facilitate wearing and long-running operation. Chapter 2 aims for the optimization of the MAC layer by using energy-saving techniques for BSNs and presents a detailed overview of this de facto standard for WSNs, which serves as a link for the introduction and description of our here proposed Distributed Queuing (DQ) MAC protocol for BSN scenarios. Chapter 3 presents an overview of the key concepts for Telemedicine, the role of textile electrodes and its integration in smart clothing. Moreover, biomedical clothing design will be discussed in social, psychological and esthetical contexts. Chapter 4 analyzes the Specific Absorption Rate (SAR) of the human body when it is exposed to WLANs devices working at the 2.4GHz radio frequency ISM band. In order to make these measurements we will use a controlled indoor place and an uncontrolled environment where no variable can be fixed.

In the field of Biomedical Engineering, engineers usually need to have background knowledge from different fields of engineering as electronics, mechanical and chemical engineering. Specialties in this field like bioinstrumentation, biomechanics, biomaterials, medical imagining, clinical engineering, bioinformatics, telemedicine and rehabilitation engineering, which will be introduced in Chapter 5 together with an overview of the field of biomedical engineering. Chapter 6 provides a theoretical review of three conceptual groups that serve as fundamental basis for m-health technology development as well as for technology adaptation to work/life practices, and for adoption and usage studies. Chapter 7 focuses on the current state, opportunities, and challenges of the mHealth field. The evaluation and verification of
Quality of Context (QoC) information play a central role to improve the consistency and correctness of context-aware U-Health applications. Therefore, the objective of Chapter 8 is to highlight the impact of QoC on the correct behavior of U-Health systems, and introduce and analyze the existing approaches of modeling, evaluating, and using QoC to improve its context-aware decision-making support. Chapter 9 reviews key background information, including central definitions, concepts, and research, followed by a presentation of 9 key considerations that are recommended for guiding the design of e-health messages.

Chapter 10 makes a survey of HISes dedicated to syndromic and epidemiological surveillance, identifying the different design and technological strategies adopted in the development of such systems. The adopted methodology for structuring this survey comprises the definition of a set of criteria for comparative analysis of the discussed HISes as well as the presentation and comparison of such HISes in the light of the defined criteria. Chapter 11 presents a system destined to offer support and to monitor the chronic and elderly patients. Compared with other similar integrated communication systems which are based on the Wi-Fi technology, the presented one has as distinctive features small dimensions, low power consumption and a considerable autonomy. Chapter 12 reviews a set of software that enables the proper management of EHRs. The authors analyze the main free software programs (technical features, programming languages, places for introduction, etc.) and they focus on the description and the comparison of the three most important open source software programs EHR (OpenMRS, OpenVistA, and OpenEMR) that are installed on different operating systems. Chapter 13 investigates the use of RFID in E-Health, how RFID can be used to store the EMR, and the security and privacy risks associated with using RFID to store the EMR.

Chapter 14 presents different aspects about Public Health Surveillance System. This system is defined as the ongoing, systematic collection, analysis and interpretation of health-related data essential to the planning, implementation, and evaluation of public health practice. Chapter 15 analyzes the impact of the new ICT-driven economic paradigm—the digital economy—on healthcare services. The authors present a classification scheme of services which considers their characteristics and their delivery modes; this scheme supports understanding the way in which the adoption of ICT impacts on healthcare services. Chapter 16 argues the case for using medical informatics in needs assessments, towards evidence-based telemedicine management and clinical-pull approaches for implementation. The aim is to reduce telemedicine projects that employ unnecessary systems and equipment, by providing them with an alternative for better planning, prior to implementation. Chapter 17 gives a detailed account on the latest development of telemedicine and PACS systems with a focus on China. In comparison with their counterparts in Europe, the results are drawn from the completed TIME project funded by EU and the initial work conducted from the newly funded FP7 project WIDTH on Infrastructure for the Digital Hospital.