Body Sensor Networks

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Guang-Zhong Yang (Ed.)

Body Sensor Networks

Foreword by Sir Magdi Yacoub

With 274 Figures, 32 in Full Color

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Foreword

Advances in science and medicine are closely linked; they are characterised by episodic imaginative leaps, often with dramatic effects on mankind and beyond. The advent of body sensor networks represents such a leap. The reason for this stems from the fact that all branches of modern medicine, ranging from prevention to complex intervention, rely heavily on early, accurate, and complete diagnosis followed by close monitoring of the results. To date, attempts at doing this consisted of intermittent contact with the individual concerned, producing a series of snapshots at personal, biochemical, mechanical, cellular, or molecular levels. This was followed by making a series of assumptions which inevitably resulted in a distortion of the real picture.

Although the human genome project has shown that we are all "equal", it confirmed the fact that each one of us has unique features at many levels, some of which include our susceptibility to disease and a particular response to many external stimuli, medicines, or procedures. This has resulted in the concept of personalised medicines or procedures promised to revolutionise our approach to healthcare. To achieve this, we need accurate individualised information obtained at many levels in a continuous fashion. This needs to be accomplished in a sensitive, respectful, non-invasive manner which does not interfere with human dignity or quality of life, and more importantly it must be affordable and cost-effective.

This book about body sensor networks represents an important step towards achieving these goals, and apart from its great promise to the community, it will stimulate much needed understanding of, and research into, biological functions through collaborative efforts between clinicians, epidemiologists, engineers, chemists, molecular biologists, mathematicians, health economists, and others. It starts with an introduction by the editor, providing a succinct overview of the history of body sensor networks and their utility, and sets the scene for the following chapters which are written by experts in the field dealing with every aspect of the topic from design to human interaction. It ends with a chapter on the future outlook of this rapidly expanding field and highlights the potential opportunities and challenges.

This volume should act as a valuable resource to a very wide spectrum of readers interested in, or inspired by, this multifaceted and exciting topic.

Professor Sir Magdi Yacoub
November 2005
London

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Their generous support has allowed us to establish and promote this exciting field of research – a topic that is so diversified, and yet brings so many challenges and innovations to each of the disciplines involved.

Guang-Zhong Yang
November 2005
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About the Editor

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Guang-Zhong Yang received PhD in Computer Science from Imperial College London and served as a senior and then principal scientist of the Cardiovascular Magnetic Resonance Unit of the Royal Brompton Hospital prior to assuming his current full-time academic post at the Department of Computing, Imperial College London. The department was rated 5* at the last RAE (research quality assessment) and has been placed among the top ten departments worldwide by several academic surveys. Professor Yang's main research interests are focussed on medical imaging, sensing, and robotics. He received a number of major international awards including the I.I. Rabi Award from the International Society for Magnetic Resonance in Medicine (ISMRM) and the Research Merit Award from the Royal Society. He is a Fellow of the IEE, Founding Director of the Royal Society/Wolfson Medical Image Computing Laboratory at Imperial College, co-founder of the Wolfson Surgical Technology Laboratory, Chairman of the Imperial College Imaging Sciences Centre, and Director of Medical Imaging, the Institute of Biomedical Engineering, Imperial College London.

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