

Preface

The applications of Sensing Technology include medical diagnostics, industrial manufacturing, defense, national security, and prevention of natural disaster. The correct detection of events by high performance sensors, and appropriate analysis of sensor signals can lead to early warning of phenomena, such as “Superstorm Sandy” which hit the eastern coast of the United States in 2012, and help to prevent deaths from these types of catastrophic incident. There is a need for interaction between researchers across technologically advanced and developing countries working on design, fabrication, and development of different sensors.

This book contains a collection of selected works stemming from the 2012 International Conference on Sensing Technology (ICST), which was held in Kolkata, India. This was the sixth time the conference had been held, and over the years it has become an incredibly successful event—in 2012 it attracted over 245 papers and provided a forum for interaction between researchers across technologically advanced and developing countries working on design, fabrication, and development of different sensors.

The conference was jointly organized by the Center for the Development of Advanced Computing (CDAC), India, and the School of Engineering and Advanced Technology, Massey University, New Zealand. We wholeheartedly thank the members of CDAC for extending their support to the conference, as well as the authors and the Technical Program Committee: without the support of these people the conference would not be possible.

Since ICST provides a platform for a wide range of sensing technologies, however of late there has been significant interest in sensors which mimic the human or other biological sensors, this book focuses specifically on work in this area. The first volume of this book, available separately, considers a broader range of sensors and their applications.

[Chapter 1](#) discusses the implementation of improved cochlea implants. Such implants seek to provide aid to those who have suffered hearing loss, a problem which impacts over 36 million people. This work seeks to improve the process through which the implants are constructed, moving from wire-based systems to microfabricated electrode arrays, which provides highly localized stimulation and recording of the neural tissue. In addition to it, electronics and sensor integration enhances working performances with added functionality.

Chapters 2–4 focus on machine vision systems, considering applications of machine vision for sorting in the food industry (Chap. 2), methods for processing of data produced by vision systems (Chap. 3), and the implementation of a stereovision system for tracking of a moving object.

Chapter 5 considers the development and validation of an electronic tongue-based sensor, seeking to compare the performance of biochemical systems against the subjective evaluation of human testers.

Chapters 6–11 study the growingly popular electronic nose type sensors, used for a variety of applications; tea quality estimation (Chaps. 7 and 10); food lifetime (Chap. 8) and vapor toxicity (Chap. 11).

The final chapter (Chap. 12) discuss the implementation of a sensor testing system, specifically aimed at physiological sensing systems. This is an important consideration; over time sensor characteristics may alter, fail or become otherwise compromised. It is therefore important to have standard methods to ensure that integrity of sensors, particularly those which are relied upon to provide life critical information.

This book is written for academic and industry professionals working in the field of sensing, instrumentation, and related fields, and is positioned to give a snapshot of the current state of the art in sensing technology, particularly from the applied perspective. The book is intended to give broad overview of the latest developments, in addition to discussing the process through which researchers go through in order to develop sensors, or related systems, which will become more widespread in the future.

We would like to express our appreciation to our distinguished authors of the chapters whose expertise and professionalism has certainly contributed significantly to this book.

Alex Mason
Subhas Chandra Mukhopadhyay
Krishanthi Padmarani Jayasundera
Nabarun Bhattacharyya

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Mason, A.; Mukhopadhyay, S.C.; Jayasundera, K.P.;

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