



Book Review

Sensors in Biomedical Applications: Fundamentals, Technology and Applications

Gábor Harsányi; CRC Press, Boca Raton, 2000, xviii + 350 pages, ISBN 1-56676-885-3 (\$189.95)

Nowadays, biomedical instruments would not be available without sophisticated sensor elements, which enable the detection of biological events and their conversion into signals. They can convert one type of quantity, such as temperature, into an equivalent signal of another type of quantity, for example an electrical or optical (or perhaps mechanical) signal. Although the practical application of such sensors has been developing rapidly, it is clarified only partly or not at all in many cases due to debates about signal excitation mechanisms, conditioning methods and the interpretation of practically measurable and theoretically expected results. The development of sensors has recently turned in the direction of microsenors, as a result of microelectronics miniaturisation and the expanding area of biomedical applications. Such microsenors need to be smaller, easy-to-use and provide rapid diagnostic and monitoring tools for personal and home use. In the near future they will also be improved to enable significant developments in computer-based medical imaging tools by obtaining more information with smaller radiation doses, providing portable multiparameter bedside monitoring, implantable self-regulator appliances and replacing the functions of human sensing organs such as artificial retinas and limbs, etc. This book presents information concerned with basic structure and technology, sensing effects, physical sensors and sensors for measuring chemical quantities in biomedicine, including biosensors.

The purpose of *Sensors in Biomedical Applications: Fundamentals, Technology and Applications* is to provide a central core of knowledge about sensors (fundamentals, design, technology, and applications), including many new sensors for measuring chemical quantities and physical

sensors in biomedicine and biosensors. It provides a broad survey of all kinds of sensor types and concentrates on all available and potential sensor devices for biomedical applications, with a focus on sensor elements; related signal conditioning and circuitry are illustrated by block diagrams and easy to understand formats. The first four chapters concentrate on the basics, lending an understanding to operation and design principles of sensor elements. Sections covering basic terms, sensor technologies, sensor structure and sensing effects are provided. The next three chapters describe application possibilities: physical sensors, sensors for measuring chemical qualities and biosensors. Finally, a chapter covering biocompatibility, a summary and future trends, and an appendix and glossary are provided, to aid in understanding the design and operation of sensors through comparison and assessment of various types of sensors with respect to their practical applications.

This volume is the definitive reference book for a broad audience, physicists, chemists and biologists, interested in the chemical basis and effects of sensors. Readers will be able to understand and know how sensors and transducers can be connected and operated, select appropriate interfaces between transducers and human bodies, estimate the reliability level and determine the most appropriate sensor and transducer types for a particular application. It is suitable for biomedical engineers and sensor specialists, physicians and students who wish to learn more about the principles and applications of biomedical sensors.

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