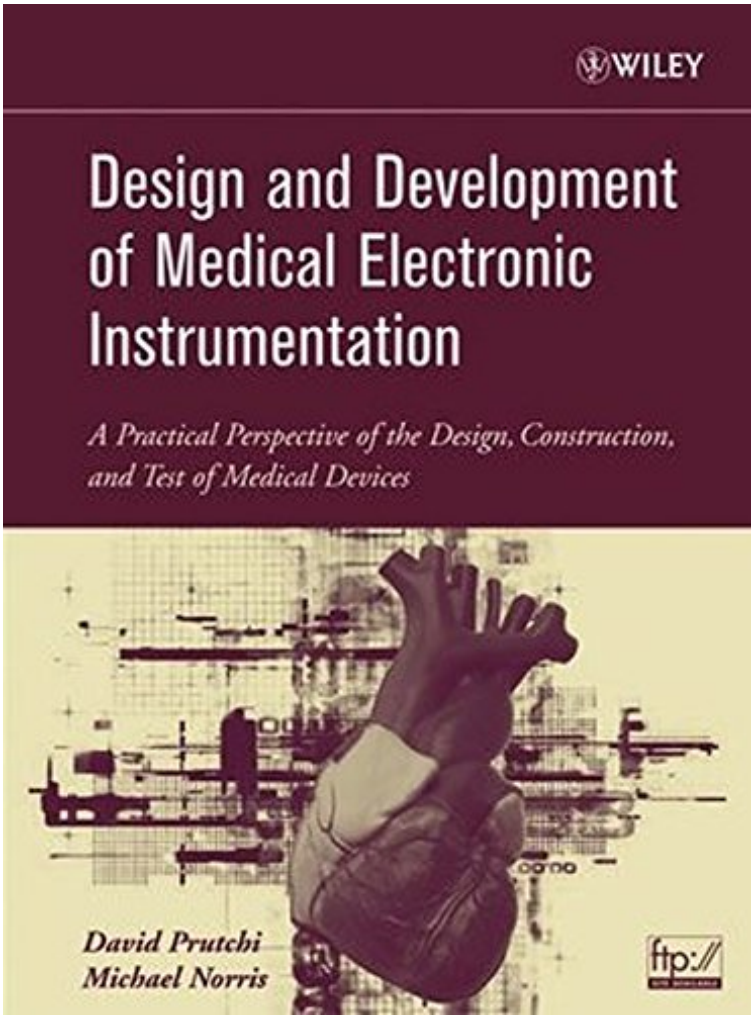
Design and Development of Medical Electronic Instrumentation: A Practical Perspective of the Design, Construction, and Test of Medical Devices

David Prutchi, Michael Norris



#850077 in Books David Prutchi 2004-11-22Original language:EnglishPDF # 1 11.22 x 1.18 x 8.52l, 2.43 #File Name: 0471676233461 pagesDesign And Development Of Medical Electronic Instrumentation | File size: 47.Mb

David Prutchi, Michael Norris : Design and Development of Medical Electronic Instrumentation: A Practical Perspective of the Design, Construction, and Test of Medical Devices before purchasing it in order to gage whether or not it would be worth my time, and all praised Design and Development of Medical Electronic Instrumentation: A Practical Perspective of the Design, Construction, and Test of Medical Devices:

0 of 0 people found the following review helpful. excellent price, thank youBy Martin LundquistOpens up a whole

new area of understanding, fast, service, excellent price, thank you.14 of 14 people found the following review helpful. Jam-packed with info on Development, sparse on DesignBy Pablo BridgesI couldn't put this book down. It contains a good description of instrumentation, including analog and digital filtering, signal conditioning, data acquisition. The authors' background is in cardiac care (pacemakers, etc.), and the book seems to focus a great deal on patient contact scenarios, whereas I would have preferred some discussion of instrumentation of other signals such as optical techniques (e.g. pulse oximetry), thermography, perhaps imaging technologies. It's a great book for anyone doing work with defibrillators/pacemakers, myography.Medical Compliance: This book is a *fantastic* reference for anyone who needs to take a medical device through regulatory compliance. It includes a succint introduction to getting through the FDA mazz, plus several chapters dedicated to EMC (radiated/conducted emissions suceptibility, etc.) and safety.Although you'll find a decent quantity of equations and theory, the book is extremely practical and hands-on, including tons of clear schematics for various affordable test circuits (field probes, Hipot, leakage, etc.), and simple, direct approaches to testing and construction.If you're looking strictly for a book on medical instrumentation, this is probably not enough. You won't find details of advanced filtering (e.g., adaptive noise cancellation), chopper detectors, fuzzy modeling logic, algorithms, etc. But even though it's sparse on "design", this book is very strong on "development". Note the emphasis on FDA in this book, and very little mention of the European Medical Device directives (which, admittedly, are somewhat harmonized).0 of 0 people found the following review helpful. the first chapters appear to electronics lessons rather than being useful if you are coming in to the medical equipment ...By EmiEmcCracked open the book and saw designs from the 1980's....stopped right there because the book was ancient and out of date with regard to regulatory. And for goodness sake, the first chapters appear to electronics lessons rather than being useful if you are coming in to the medical equipment sector.

Design and Development of Medical Electronic Instrumentation fills a gap in the existing medical electronic devices literature by providing background and examples of how medical instrumentation is actually designed and tested. The book includes practical examples and projects, including working schematics, ranging in difficulty from simple biopotential amplifiers to computer-controlled defibrillators. Covering every stage of the development process, the book provides complete coverage of the practical aspects of amplifying, processing, simulating and evoking biopotentials. In addition, two chapters address the issue of safety in the development of electronic medical devices, and providing valuable insider advice.

"The book is user-friendly, accurate...and will be very useful to anyone with a basic understanding of circuit theory" (Annals of Biomedical Engineering, June 2006) "This reviewer will find this text a valued part of his library for the several areas extremely well elucidated. And talking with a few colleagues, the reviewer confirmed that this text will have wide appeal" (Biomedical Instrumentation Technology, July/August 2005) "details this application's unique requirements and constraints, exploring with general discussion, schematic diagrams, representative waveforms, and typical-design photos." (EDN Online, January 12, 2005)From the Back CoverMaster the building blocks of medical devices with this hands-on guide This book provides a uniquely practical approach that enables readers to learn the design of medical electronic devices through the analysis of specific projects. Walking you through the building blocks of implementing medical devices, Design and Development of Medical Electronic Instrumentation addresses the practical aspects of amplifying, processing, simulating, and evoking biopotentials. It provides real-world projects that range from simple biopotential amplifiers all the way to a computer-controlled defibrillator. Anyone with a basic understanding of circuit design and electrical engineering mathematics and experience in electronic prototype construction will find these projects accessible. Chapters discuss: Biopotential amplifiers, including a refresher on the origin and acquisition of physiological electrical signals Spectral content of biosignals, filter design, and the selection of frequency ranges for biopotential amplifiers Design of safe medical device prototypes International regulations and design practices for electromagnetic compatibility of medical devices Data acquisition, smart sensors, analog-to-digital conversion, and high-resolution spectral analysis of physiological signals Artificial signal sources for simulating physiological events Principles, clinical applications, and design of excitable tissue stimulators Design of cardiac pacemakers and defibrillators, including a refresher on the electrophysiology of the heart, its conduction deficiencies, and arrhythmias With access to an ftp site that contains the software and information needed to successfully complete the projects outlined, plus a special epilogue on how to bring a medical device to market, this book will help one quickly master the essentials of medical device design and build sophisticated instrumentation for a broad range of purposes.About the AuthorDAVID PRUTCHI, PhD, received his doctorate in biomedical engineering from Tel-Aviv University, Israel. Currently, he is Vice President of Product Development for Impulse Dynamics. He has over fifteen years of experience in biomedical and medical electronic instrumentation research, design, and management. He has published over thirty papers and holds over sixty patents in the field of active implantable medical devices. MICHAEL NORRIS is a senior electronics engineer for Impulse Dynamics. He has over twenty-five years of experience as a medical device designer, including research, design and development of analog and digital circuits, microprocessors,

and embedded software.