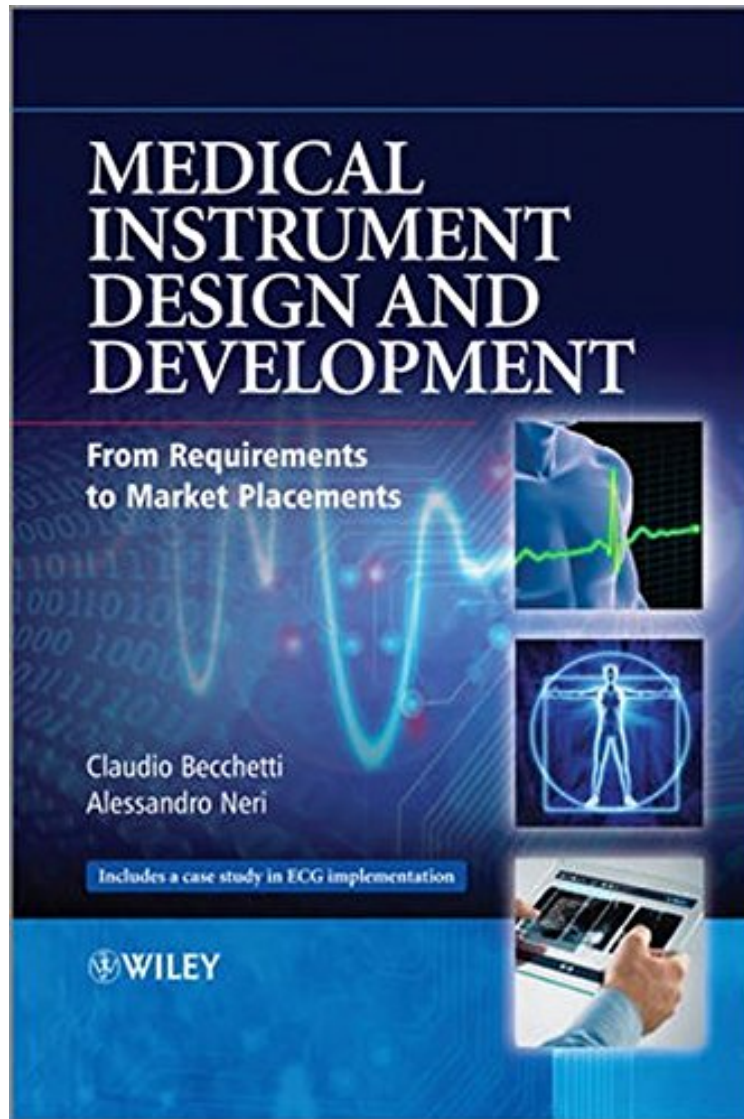


Medical Instrument Design and Development: From Requirements to Market Placements

Claudio Becchetti, Alessandro Neri

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Claudio Becchetti, Alessandro Neri : Medical Instrument Design and Development: From Requirements to Market Placements before purchasing it in order to gage whether or not it would be worth my time, and all praised Medical Instrument Design and Development: From Requirements to Market Placements:

1 of 1 people found the following review helpful. Good for practitioners and studentsBy BeckerThe book discloses the details of an Electrocardiograph (ECG) sold on the market. All the ECG electrical circuits are published under an open

source creative common licence. This cannot be found in other books. The material is quite clear. All the eight chapters have a theory part where I found the concepts discussed at University level. There are also many summary tables and graphs that help for a quick reading or when studying. Each chapter contains an implementation section that covers first general medical device issues. Then, the implementation is focused on the disclosed ECG. The "Applied Electronics" chapter is really detailed; sometimes too accurate for a general audience. Nice the approach to show how real world differs from ideal behaviour in electronic circuits: there are many tables comparing ideal and real behaviour of main components. Somehow, this chapter recalls the style of the popular "the Art of Electronics". The software chapter is organised around IEC 62304 (medical device software standard). Stimulating the chapter on medical informatics and E-Health; not too detailed but sufficient for a quick overview. Remarkable the certification chapter that covers mainly European and US market. Good general overview, very interesting the disclosure of the certification documents of the ECG, sometimes to details on the standards. The book is full of well-organized information, although with some mistakes. Helpful for practitioners in medical device area, useful for students to understand how university courses are used to design medical devices and how a commercial device is realized in all its design steps and components.

This book explains all of the stages involved in developing medical devices; from concept to medical approval including system engineering, bioinstrumentation design, signal processing, electronics, software and ICT with Cloud and e-Health development. Medical Instrument Design and Development offers a comprehensive theoretical background with extensive use of diagrams, graphics and tables (around 400 throughout the book). The book explains how the theory is translated into industrial medical products using a market-sold Electrocardiograph disclosed in its design by the Gamma Cardio Soft manufacturer. The sequence of the chapters reflects the product development lifecycle. Each chapter is focused on a specific University course and is divided into two sections: theory and implementation. The theory sections explain the main concepts and principles which remain valid across technological evolutions of medical instrumentation. The Implementation sections show how the theory is translated into a medical product. The Electrocardiograph (ECG or EKG) is used as an example as it is a suitable device to explore to fully understand medical instrumentation since it is sufficiently simple but encompasses all the main areas involved in developing medical electronic equipment. Key Features: Introduces a system-level approach to product design Covers topics such as bioinstrumentation, signal processing, information theory, electronics, software, firmware, telemedicine, e-Health and medical device certification Explains how to use theory to implement a market product (using ECG as an example) Examines the design and applications of main medical instruments Details the additional know-how required for product implementation: business context, system design, project management, intellectual property rights, product life cycle, etc. Includes an accompanying website with the design of the certified ECG product (www.gammacardiosoft.it/book) Discloses the details of a marketed ECG Product (from Gamma Cardio Soft) compliant with the ANSI standard AAMI EC 11 under open licenses (GNU GPL, Creative Common) This book is written for biomedical engineering courses (upper-level undergraduate and graduate students) and for engineers interested in medical instrumentation/device design with a comprehensive and interdisciplinary system perspective.

"The book tackles a very interesting topic, namely "how medical devices and instruments are designed from the conception to the market placement". Its utility and educational potential is high because it shows how the principles of design and the methodological steps for final product implementation are applied in a specific case, an electrocardiograph (ECG) device. "- From a reviewer of the editorial review process." "..., the electronic details of a market-sold ECG device are fully presented. The choice for such a device as a case study is fortunate since it is a device that "is sufficiently simple to be addressed in a book at University level, but it is also adequate to show the main components required for any complex medical device design". "- From a reviewer of the editorial review process." "The succession of chapters in the book is sound, leading, step-by-step, from general principles to the final development stages. The division of each chapter into a theoretical and an implementation part is appropriate and helps greatly in connecting each step in the design and development phases from both the theoretical principles and the actual case study perspective. This is crucial, since the material existing in the book is inevitably overwhelming. The reader is also helped by the preface of each chapter ("Chapter Organization"). "The content is very relevant. ... The use of this text would be beneficial in a 3-4 credit hour educational course, especially at the graduate level and as a reference in professional/company engineering situations I will use this text for Masters course at my University." "- From a reviewer of the editorial review process." the book seems well suited for biomedical engineering courses and is also of interest to design engineers. Its publication will be an interesting and rather innovative contribution, especially due to its "all-inclusive" scope in the presentation of design and implementation of medical devices, in conjunction with the specific details given for the commercial ECG device that constitutes the case study of the book." - From a reviewer of the editorial review process. From the Back Cover This book explains all of the stages involved in developing medical devices; from concept to medical approval including system engineering, bioinstrumentation design, signal processing, electronics, software and ICT with Cloud and e-Health development. Medical Instrument

Design and Development offers a comprehensive theoretical background with extensive use of diagrams, graphics and tables (around 400 throughout the book). The book explains how the theory is translated into industrial medical products using a market-sold Electrocardiograph disclosed in its design by the Gamma Cardio Soft manufacturer. The sequence of the chapters reflects the product development lifecycle. Each chapter is focused on a specific University course and is divided into two sections: theory and implementation. The theory sections explain the main concepts and principles which remain valid across technological evolutions of medical instrumentation. The Implementation sections show how the theory is translated into a medical product. The Electrocardiograph (ECG or EKG) is used as an example as it is a suitable device to explore to fully understand medical instrumentation since it is sufficiently simple but encompasses all the main areas involved in developing medical electronic equipment. Key Features: Introduces a system-level approach to product design Covers topics such as bioinstrumentation, signal processing, information theory, electronics, software, firmware, telemedicine, e-Health and medical device certification Explains how to use theory to implement a market product (using ECG as an example) Examines the design and applications of main medical instruments Details the additional know-how required for product implementation: business context, system design, project management, intellectual property rights, product life cycle, etc. Includes an accompanying website with the design of the certified ECG product (www.gammacardiosoft.it/book) Discloses the details of a marketed ECG Product (from Gamma Cardio Soft) compliant with the ANSI standard AAMI EC 11 under open licenses (GNU GPL, Creative Common) This book is written for biomedical engineering courses (upper-level undergraduate and graduate students) and for engineers interested in medical instrumentation/device design with a comprehensive and interdisciplinary system perspective.

About the Author Dr. Claudio Becchetti, RadioLabs, Italy Claudio Becchetti graduated with honors in Electronic Engineering in 1994 at the University of Rome, where he achieved the Ph.D. in Telecommunications in 1999. From 2002 to 2009, he was adjoint professor at the University "La Sapienza", faculty of Telecommunication Engineering where he held first a course on Industrial design and then a course on Signal Theory. Claudio has 7 years teaching experience working with students studying ECG. This device is well suited as a practical example for signal theory, digital signal processing, electronics and software engineering. Professor Alessandro Neri, University of Roma TRE, Italy Alessandro Neri he received the Doctoral Degree cum laude in Electronic Engineering from the University of Rome "La Sapienza" in 1977. Since 1992 he is responsible for coordination and management of research and teaching activities in the Telecommunication fields at the University of Roma TRE, currently leading the Digital Signal Processing, Multimedia Optical Communications at the Applied Electronics Department. His research activity has mainly been focused on information theory, signal theory, and signal and image processing and their applications to both telecommunications systems and remote sensing.