



Handbook of MRI Pulse Sequences

By Matt A. Bernstein, Kevin F. King, Xiaohong Joe Zhou

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Magnetic Resonance Imaging (MRI) is among the most important medical imaging techniques available today. There is an installed base of approximately 15,000 MRI scanners worldwide. Each of these scanners is capable of running many different "pulse sequences", which are governed by physics and engineering principles, and implemented by software programs that control the MRI hardware. To utilize an MRI scanner to the fullest extent, a conceptual understanding of its pulse sequences is crucial. *Handbook of MRI Pulse Sequences* offers a complete guide that can help the scientists, engineers, clinicians, and technologists in the field of MRI understand and better employ their scanner.

- Explains pulse sequences, their components, and the associated image reconstruction methods commonly used in MRI
- Provides self-contained sections for individual techniques
- Can be used as a quick reference guide or as a resource for deeper study
- Includes both non-mathematical and mathematical descriptions
- Contains numerous figures, tables, references, and worked example problems

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Editorial Review

Review

"...I believe it will become the 'gold standard' text for people involved in MR research or applications because of its clear and concise descriptions of most aspects of MRI." --**Michael Jacobs, Johns Hopkins School of Medicine, Baltimore, Maryland in the *JOURNAL OF MAGNETIC RESONANCE IMAGING* (2006)**

"...an outstanding reference source that covers all the important aspects of pulse sequence design and implementation...it fills an important gap not addressed by the other texts on MRI physics. It should be on the shelf or next to the pulse programming computer of anyone who designs sequences or is a serious user of MRI/S methods of any type. The book will stand the test of time, even in a field as rapidly evolving as MRI, and will become a definitive classic." --**G.H. Glover, Stanford University School of Medicine (2005)**

"...a tour de force; the authors have written an exemplary pedagogical treatise on MRI pulse sequences targeted to scientists and engineers interested in understanding and constructing pulse sequences. While the book states as a prerequisite a basic understanding of MR physics, even someone with only a rudimentary understanding of MR can follow most of the discussion, which I attribute to the masterful execution by the authors. The writing is consistently good across all chapters...Anyone conducting research that makes use of the current state of MRI techniques should have this book on the shelf. It could serve as a reference for an advanced course or a laboratory course on MRI pulses." --***Medical Physics* (May 2005)**

From the Back Cover

Excerpts from the forewords of this book:

"...This book is the most valiant and successful attempt yet to provide a useful description of this [pulse sequence] 'zoo', and to relate and classify the various denizens in it. ... I believe that no MRI developer or user can read this book without learning more about the field, as I have."

--From the foreword by Paul C. Lauterbur, Ph.D., 2003 Nobel Laureate in Physiology or Medicine, Professor of Chemistry, Biophysics, Bioengineering, and Medical Information Sciences, University of Illinois.

"...This book will become one of the classic texts in the field. It will play a key role in helping the next generation of scientists and MRI clinicians to continue the process of invention."

--From the foreword by Richard L. Ehman, M.D., Professor of Radiology, Mayo Clinic

This indispensable guide gives concise yet comprehensive descriptions of the pulse sequences commonly used on modern MRI scanners. The book consists of a total of 65 self-contained sections, each focused on a single subject. Written primarily for scientists, engineers, radiologists, and graduate students who are interested in an in-depth understanding of various MRI pulse sequences, it serves readers with a diverse set of backgrounds by providing both non-mathematical and mathematical descriptions.

The book is divided into five parts. Part I of the book describes two mathematical tools, Fourier transforms and the rotating reference frame, that are useful for understanding MRI pulse sequences. The second part is devoted to a wide variety of radiofrequency (RF) pulses, and the third part focuses on gradient waveforms.

Data acquisition, image reconstruction, and physiological monitoring related to pulse sequence design form the subject of Part IV of the book. Once this foundation is established, Part V of the book describes the underlying principles, implementation, and selected applications of many pulse sequences commonly in use today.

The extensive topic coverage and cross-referencing makes this book ideal for beginners learning the building blocks of MRI pulse sequence design, as well as for experienced professionals who are seeking deeper knowledge of a particular technique.

Key Features:

- Explains pulse sequences, their components, and the associated image reconstruction methods commonly used in MRI
- Provides self-contained sections for individual techniques
- Can be used as a quick reference guide or as a resource for deeper study
- Includes both non-mathematical and mathematical descriptions
- Contains numerous figures, tables, references, and worked example problems

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A thorough reference guide on pulse sequences and reconstruction methods commonly used in Magnetic Resonance Imaging (MRI).

Users Review

From reader reviews:

Willie Clark:

What do you regarding book? It is not important together with you? Or just adding material when you want something to explain what your own problem? How about your extra time? Or are you busy man? If you don't have spare time to perform others business, it is make you feel bored faster. And you have free time? What did you do? All people has many questions above. They have to answer that question due to the fact just their can do in which. It said that about e-book. Book is familiar on every person. Yes, it is appropriate. Because start from on pre-school until university need this specific Handbook of MRI Pulse Sequences to read.

Jessie Nathan:

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