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978-0-521-19065-7 - Introduction to Medical Imaging: Physics, Engineering and Clinical Applications

Nadine Barrie Smith and Andrew Webb

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Introduction to Medical Imaging Physics, Engineering and Clinical Applications

Covering the basics of X-rays, CT, PET, nuclear medicine, ultrasound and MRI, this textbook provides senior undergraduate and beginning graduate students with a broad introduction to medical imaging. Over 130 end-of-chapter exercises are included, in addition to solved example problems, which enable students to master the theory as well as providing them with the tools needed to solve more difficult problems. The basic theory, instrumentation and state-of-the-art techniques and applications are covered, bringing students immediately up-to-date with recent developments, such as combined computed tomography/positron emission tomography, multi-slice CT, four-dimensional ultrasound and parallel imaging MR technology. Clinical examples provide practical applications of physics and engineering knowledge to medicine. Finally, helpful references to specialized texts, recent review articles and relevant scientific journals are provided at the end of each chapter, making this an ideal textbook for a one-semester course in medical imaging.

Nadine Barrie Smith is a faculty member in the Bioengineering Department and the Graduate Program in Acoustics at Pennsylvania State University. She also holds a visiting faculty position at the Leiden University Medical Center. She is a Senior Member of the IEEE, and of the American Institute of Ultrasound in Medicine where she is on both the Bioeffects and Technical Standards Committees. Her current research involves ultrasound transducer design, ultrasound imaging and therapeutic applications of ultrasound. She has taught undergraduate medical imaging and graduate ultrasound imaging courses for the past 10 years.

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“This is an excellently prepared textbook for a senior/first year graduate level course. It explains physical concepts in an easily understandable manner. In addition, a problem set is included after each chapter. Very few books on the market today have this choice. I would definitely use it for teaching a medical imaging class at USC.”

K. Kirk Shung, University of Southern California

“I have anxiously anticipated the release of this book and will use it with both students and trainees.”

Michael B. Smith, Novartis Institutes for Biomedical Research

“An excellent and approachable text for both undergraduate and graduate student.”

Richard Magin, University of Illinois at Chicago

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