

**INFORMATION PROCESSING IN MEDICAL IMAGING.** *S. L. Bacharach. Dordrecht, The Netherlands, Martinus Nijoff, 1986. 555 pp, \$99.50*

This book consists of 38 papers from the Ninth Conference on Information Processing in Medical Imaging, held in June, 1985. Many of the papers deal with radiological image processing, particularly in nuclear medicine and nuclear magnetic resonance; however, other areas such as ophthalmology are also represented. The material presented is largely research on medical image processing, but more background material is presented than is typical of papers from conference proceedings.

It is tempting to dismiss this book as a conference proceeding on a subject of limited interest. That would be a mistake, however. The papers are generally of good quality and several interesting topics are discussed—factor analysis, cluster analysis, artificial intelligence, time-of-flight image analysis, image description, image processing languages, nuclear medical instrumentation, picture archiving, and communication.

Although the book is a reproduction of the typed manuscripts, image quality is moderately well preserved. This book is not of general interest in the nuclear medicine community, and it would not serve as an introductory text on image processing in nuclear medicine. But it does contain several interesting papers on medical image processing, and it should be available in the libraries of those centers doing research on image processing in nuclear medicine.

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**CARDIAC IMAGING AND IMAGE PROCESSING.** *S.M. Collins, D.J. Skorton, Eds. New York, McGraw-Hill Book Company, 1986, 430 pp, \$54.95*

This is a multi-authored book (28 authors for 16 chapters) whose aim is to

facilitate (. . . .) communication between imaging scientists (sic) and physicians, by presenting information of common interest, directed at improving the knowledge base of both groups . . . .

The 16 chapters are grouped in three parts as follows:

I. Overview of medical imaging techniques: Principle of image formation. II. Introduction to computers and image processing. III. Applications of digital computer techniques to cardiac imaging.

In Chapter 1, ultrasound is nicely described, but the references to digital storage and display manage to lack both generality and precision. Similarly, in Chapter 2 the modulation transfer function is introduced as a peculiarity of digital angiography. The same chapter, however, describes the principle of x-ray tubes, scatter grids, image intensifiers, automatic brightness stabilizers, cine cameras and films before reaching (Thalassa ! Thalassa !) the video camera and video digitization. Digitization is, furthermore, described exclusively in terms of the x,y coordinate deflection of the signals.

Chapter 3 is disturbingly familiar, partially because the author recycles figures and previously published material, although this chapter is clear and complete. Similarly, Chapter 4 is clear and exhaustive, but the inclusion of tracer kinetics, again as a peculiar application of contrast computed transmission tomography, is difficult to explain. Chapter 5 on nuclear magnetic resonance is a predictable standard introduction, in which we are blissfully spared turning tops.

The introduction to digital computers in Chapter 6 is reduced to hardly more than a glossary, whose aim seems to be to allow the reader to make intelligent noises at the next faculty tea party. Chapter 7 introduces video digitization, and would have duplicate a more complete Chapter 2.

Chapter 8 gives a good and clear overview of some image processing methods, including edge detection, and filtering in image or frequency domain. This is, frankly, the first well-focused chapter. Chapter 9, which is sometimes repetitive with the previous one, does a good job of surveying image processing in echocardiography.

But in Chapter 10 the problem of duplication becomes annoying: we are given a repeat of the digitization process, another edge-detection description, and a third geometric correction, but coronary blood flow is well analyzed. I could not detect, however, how Chapter 11 could be distinguished from Chapter 10 and Chapter 2.

As one now has learned to expect, Chapter 12, on computers in cardiovascular nuclear medicine is repetitive on several points. Phase analysis in gated studies, however, is well covered. Image processing and quantification of thallium myocardial studies are clearly explained.

Chapter 13 on positron emission imaging is originally structured, and all the material included fits logically, with minimal overlap with material in other chapters. The same can be said about Chapter 14 on the high speed volume imager.

In short, it seems as if the authors of individual chapters did not have a precise idea about the chapter's function. There is too much overlap, and this (naturally) associated with a certain superficiality, since too much time and effort is spent on the beaten path. Somehow this failure seems more pronounced than in other multi-authored books, but this is probably more perception than reality: this lack of coherency triggers increasing sensitivity in this reviewer.

The presentation is good, illustrations are very good, with a few exceptions. I found no errors in the presented material, but for some chapters the bibliography seems a bit parochial, since the primary reference is often replaced by a reference on the particular application. Imaging specialists will still have their work left undone. In fact, the image processing part, while often good, is too primitive for imaging scientists (?), and *pari passu*, the same is true for the clinical information.

I recommend this book only as a very introductory text, with the exception of Chapters 7, 8, 9, 10 (partially), 13, and 14. The latter two I recommend enthusiastically.

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