

## Book reviews

*Computer imaging: digital image analysis and processing.* By S E Umbaugh. pp. 696, 2005 (CRC Press, Taylor & Francis Group, Boca Raton, FL), £38.99  
ISBN 0-8493-2919-1

This is a comprehensive text-book dealing with all aspects of the acquisition and processing of visual information by computer. The treatment given is oriented towards application of the techniques and examples are taken from a wide range of fields, which includes medical imaging but deals with other areas such as the entertainment industry and space exploration. The book is intended primarily for use by university students and staff in teaching image processing courses or research, but will be useful for professionals working in the commercial sector, government research or the health service. The book is designed for use by scientists and engineers. It is well written and a strong computing background is not required in order to gain a conceptual understanding of the subject from the book. However, far more can be gained if the reader has computing and programming skills. Tutorial exercises are included with each chapter to provide hands-on experience and enable the reader to gain insight into the use of various image analysis and processing algorithms. The book is illustrated throughout with images to demonstrate the effects of the processing techniques described. Since the book is not specifically aimed at the medical sector, it is not a book to dip into to find the techniques applicable to a particular aspect of medical imaging, but rather to obtain a grounding in image analysis and processing techniques.

The book is divided into four sections. The introduction to computer imaging presents a global picture to enable the reader to gain an understanding of the overall process. It contains the basic concepts required to understand computer imaging, including optics, imaging analysis and presentation. The second and third sections on digital image analysis and image processing make up over three-quarters of the text. Section 2 describes the tools, concepts and models required for analysing digital images, including segmentation, transforms and feature analysis. Section 3 on image processing starts with visual perception and discusses the application of processing images for human consumption, including topics such as enhancement, restoration and compression. Section 4 contains information on computer vision and image processing tools software developed at the author's department. A windows version of the software is on a CD accompanying the book. This has a menu-driven user interface to facilitate applications and is designed to allow the reader to apply the algorithms. A knowledge of C and C++ programming will allow the user to develop the algorithms further for their own applications.

The book provides a valuable text for those wishing to study and develop skills in image analysis and processing. It differs from other texts by including an insight into the application of the techniques in many different fields.

C J MARTIN

*Coronary radiology.* By M Oudkerk. pp. x+254, 2004 (Springer-Verlag, Berlin, Heidelberg, New York), £107.50

ISBN 3-540-43640-5

This book provides an overview of the various imaging modalities used to assess the coronary vessels. Five main areas are covered: anatomy, invasive imaging, non-invasive imaging, calcification and multidimensional computed coronary visualization. The invasive imaging section includes intracoronary ultrasound. Non-invasive imaging principally outlines coronary CT, but also addresses MR coronary angiography and electron beam CT. The calcification chapter makes up a significant proportion of the book and outlines coronary calcification imaging, its epidemiology and the clinical implications. In depth coverage of imaging rendering techniques is found in the final chapter. This particular section would also be useful to imaging in other areas of the body.

The large sections are divided into clearly set short chapters which lend this book well to reading in multiple short time periods. Furthermore, the text flows well and it is an easy read. Correlation between modalities is frequently displayed particularly with regard to conventional angiography positioning and CT angiography positioning. This is evident in the demonstration of anatomy with direct correlations between diagrammatic angiographic positioning with conventional angiograms and CT angiographic images displayed together. The images are clear, up to date and well set out. The use of diagrams to assist explanation is frequent and works well. References are displayed throughout the text with lists found at the end of each chapter. Overall this book allows the reader to gain an understanding rather than simply use for reference.

B HOLLOWAY

*Molecular basis of breast cancer: prevention and treatment.* By J Russo and I H Russo. pp. xiv+448, 2004 (Springer-Verlag, Berlin, Heidelberg, New York), £154.00

ISBN 3-540-00391-6

This magnum opus covers the entire molecular basis of breast cancer in ten self-contained chapters. Epidemiological considerations in breast cancer are covered in chapter one. This reviews geographical influences, ionizing radiation, electromagnetic field, reproductive aspects and environmental factors, including smoking and alcohol. This is an interesting introduction to the subject.

The development of the breast is described in the second chapter in great detail. A knowledge of breast development is critical in understanding breast cancer risks, such as its inverse relationship with early parity. The level and depth of information is excellent. The changes in breast structure from intrauterine life to old age are described in detail.

Endocrine control of breast development is covered in chapter three. The response of breast tissue to oestrogen

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and other hormones is summarized. The role of oestrogen in breast cancer is described in chapter four. Increased risk of breast cancer has been associated with the early onset of menstruation, nulliparity or delayed first childbirth, short duration of breast feeding, late menopause, use of hormone therapy and increased bone density. All of which suggest that prolonged exposure to female sex hormones may be a cause. The implications of this are comprehensively covered. The pathogenesis of breast cancer is described in the fifth chapter. Two chapters cover animal and *in vivo* models of human breast cancer.

The final two chapters cover preventative strategies in breast cancer and the new paradigm in breast cancer prevention. Four basic preventative strategies:

physioprevention, bioprevention, chemoprevention and socioprevention are considered. The mechanisms for each are described and examples of a risk reduction technique described.

The book is well written in an easy to follow style. It is profusely illustrated with numerous figures, many of which are in colour. The high production values explain why the book costs over £150. Its high cost will inevitably limit the number of libraries and individuals who may purchase it, which is a pity. Most libraries would benefit from having this textbook on their shelves. It is an excellent book which will be of interest to both researchers and lay individuals wanting to obtain background information on breast cancer.

K FAULKNER