Biomedical Image Analysis: Statistical and Variational Methods

By Aly A. Farag

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Ideal for classroom use and self-study, this book explains the implementation of the most effective modern methods in image analysis, covering segmentation, registration and visualisation, and focusing on the key theories, algorithms and applications that have emerged from recent progress in computer vision, imaging and computational biomedical science. Structured around five core building blocks - signals, systems, image formation and modality; stochastic models; computational geometry; level set methods; and tools and CAD models - it provides a solid overview of the field. Mathematical and statistical topics are presented in a straightforward manner, enabling the reader to gain a deep understanding of the subject without becoming entangled in mathematical complexities. Theory is connected to practical examples in x-ray, ultrasound, nuclear medicine, MRI and CT imaging, removing the abstract nature of the models and assisting reader understanding.

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Editorial Review

About the Author
Aly A. Farag is a Professor of Electrical and Computer Engineering, and founding Director of the Computer Vision and Image Processing Laboratory, at the University of Louisville. His research interests centre around object modelling with biomedical applications, and his more recent biomedical inventions have led to the development of improved methods for tubular object modelling, virtual colonoscopies and lung nodule detection and classification based on CT scans, real-time monitoring of vital signs from thermal imaging, and image-based reconstruction of the human jaw.

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