Theoretical Foundations of Digital Imaging Using MATLAB® (Chapman & Hall/CRC Mathematical and Computational Imaging Sciences Series)

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With the ubiquitous use of digital imaging, a new profession has emerged: imaging engineering. Designed for newcomers to imaging science and engineering, **Theoretical Foundations of Digital Imaging Using MATLAB**® treats the theory of digital imaging as a specific branch of science. It covers the subject in its entirety, from image formation to image perfecting.

Based on the author's 50 years of working and teaching in the field, the text first addresses the problem of converting images into digital signals that can be stored, transmitted, and processed on digital computers. It then explains how to adequately represent image transformations on computers. After presenting several examples of computational imaging, including numerical reconstruction of holograms and virtual image formation through computer-generated display holograms, the author introduces methods for image perfect resampling and building continuous image models. He also examines the fundamental problem of the optimal estimation of image parameters, such as how to localize targets in images. The book concludes with a comprehensive discussion of linear and nonlinear filtering methods for image perfecting and enhancement.

Helping you master digital imaging, this book presents a unified theoretical basis for understanding and designing methods of imaging and image processing. To facilitate a deeper understanding of the major results, it offers a number of exercises supported by MATLAB programs, with the code available at www.crcpress.com.

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