<<数字图像处理>>

图书基本信息

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前言

Solutions to problems in the field of digital image processing generally requireextensive experimental work involving software simulation and testing with large setsof sample images Although algorithm development typically is based on theoreticalunderpinnings, the actual implementation of these algorithms almost always requiresparameter estimation and, frequently, algorithm revision and comparison of candidatesolutions. Thus, selection of a flexible, comprehensive, and well-documented softwaredevelopment environment is a key factor that has important implications in the cost,development time, and portability of image processing solutions In spite of its importance, surprisingly little has been written on this aspect of thefield in the form of textbook material dealing with both theoretical principles and soft-ware implementation of digital image processing concepts. This book was written forjust this purpose. Its main objective is to provide a foundation for implementing imageprocessing algorithms using modem software tools.A complementary objective was toprepare a book that is self-contained and easily readable by individuals with a basicbackground in digital image processing, mathematical analysis, and computer pro-gramming, all at a level typical of that found in a junior/senior curriculum in a techni-cal discipline. Rudimentary knowledge of MATLAB also is desirable. To achieve these objectives, we felt that two key ingredients were needed. Thefirst was to select image processing material that is representative of material cov-ered in a formal course of instruction in this field. The second was to select soft-ware tools that are well supported and documented, and which have a wide rangeof applications in the "real" world. To meet the first objective, most of the theoretical concepts in the following chapterswere selected from Digital Image Processing by Gonzalez and Woods, which has beenthe choice introductory textbook used by educators all over the world for over twodecadesThe software tools selected are from the MATLAB Image ProcessingToolbox（IPT）, which similarly occupies a position of eminence in both education and industrialapplications A basic strategy followed in the preparation of the book was to provide aseamless integration of well-established theoretical concepts and their implementationusing state-of-the-art software tools The book is organized along the same lines as Digital Image Processing. In this way,the reader has easy access to a more detailed treatment of all the image processingconcepts discussed here, as well as an up-to-date set of references for further reading.Following this approach made it possible to present theoretical material in a succinctmanner and thus we were able to maintain a focus on the software implementation as-pects of image processing problem solutions Because it works in the MATLAB com-puting environment, the Image Processing Toolbox offers some significant advantages,not only in the breadth of its computational tools, but also because it is supportedunder most operating systems in use today.

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内容概要

本书是图像处理理论与以MATLAB为主要工具的软件实践方法相结合的第一本书。
特色在于重点强调如何通过开发新代码来加强软件工具。
介绍MATLAB编程基础知识之后，讲述了图像处理的主干内容，包括灰度变换、线性和非线性空间滤波、频率域滤波、图像恢复与配准、彩色图像处理、小波、图像数据压缩、形态学图像处理、图像分割、区域和边界表示与描述，以及目标识别。
本书可供从事信号与信息处理、汁算机科学与技术、通信工程、地球物理等专业的大专院校师生学习参考。

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章节摘录

插图：Another way to obtain help for a specific function is by typing doe followedby the function name at the command prompt. For example, typing doe f o r matdisplays documentation for the function called format in the display pane ofthe Help Browser. This command opens the browser if it is not already open. M-functions have two types of information that can be displayed by theuser. The first is called the H1 line, which contains the function name and aone-line description. The second is a block of explanation called the Help textblock （these are discussed in detail in Section 2.10.1）. Typing help at theprompt followed by a function name displays both the H1 line and the Helptext for that function in the Command Window. Occasionally, this informationcan be more up to date than the information in the Help browser because it isextracted directly from the documentation of the M-function in question. Typ-ing lookfor followed by a keyword displays all the H1 lines that contain thatkeyword. This function is useful when looking for a particular topic withoutknowing the names of applicable functions. For example, typing look for edgeat the prompt displays all the H1 lines containing that keyword. Because theH1 line contains the function name, it then becomes possible to look at specif-ic functions using the other help methods. Typing lookfor edge -all at theprompt displays the H1 line of all functions that contain the word edge in ei-ther the H1 line or the Help text block.Words that contain the characters edgealso are detected. For example, the H1 line of a function containing the wordpolyedge in the H1 line or Help text would also be displayed.

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