

数字图像处理(第三版)(英文版)



[数字图像处理\(第三版\)\(英文版\) 下载链接1](#)

著者:[美]拉斐尔·C·冈萨雷斯 (Rafael C.Gonzalez)

出版者:电子工业出版社

出版时间:2017-1

装帧:平装

isbn:9787121305405

本书是关于数字图像处理的经典著作，作者在对32个国家的134所院校和研究所的教师、学生及自学者进行广泛调查的基础上编写了第三版。除保留第二版的大部分主要内容外，还根据收集的建议从13个方面进行了修订，新增了400多幅图像、200多个图表和80多道习题，同时融入了近年来本科学领域的重要发展，使本书具有鲜明的特色与时效

性。全书共分12章，包括绪论、数字图像基础、灰度变换与空间滤波、频域滤波、图像复原与重建、彩色图像处理、小波及多分辨率处理、图像压缩、形态学图像处理、图像分割、表现与描述、目标识别。

作者介绍:

Rafael

C.Gonzalez（拉斐尔.冈萨雷斯）：美国田纳西大学电气和计算机工程系教授、田纳西大学图像和模式分析实验室、机器人和计算机视觉实验室创始人、IEEE会士，研究领域为模式识别、图像处理和机器人，其著作已被全球范围内的600多所大学和研究所采用。

Richard E. Woods 美国田纳西大学电气工程系博士，IEEE会员。

目录: Preface

Acknowledgments

The Book Web Site

About the Authors

1Introduction

1.1What Is Digital Image Processing?

1.2The Origins of Digital Image Processing

1.3Examples of Fields that Use Digital Image Processing

1.3.1 Gamma—Ray Imaging

1.3.2 X—Ray Imaging

1.3.3 Imaging in the Ultraviolet Band

1.3.4 Imaging in the Visible and Infrared Bands

1.3.5 Imaging in the Microwave Band

1.3.6 Imaging in the Radio Band

1.3.7 Examples in which Other Imaging Modalities Are Used

1.4Fundamental Steps in Digital Image Processing

1.5Components of an Image Processing System

Summary

References and Further Reading

2 Digital Image Fundamentals

2.1Elements of Visual Perception

2.1.1 Structure of the Human Eye

2.1.2 Image Formation in the Eye

2.1.3 Brightness Adaptation and Discrimination

2.2Light and the Electromagnetic Spectrum

2.3Image Sensing and Acquisition

2.3.1 Image Acquisition Using a Single Sensor

2.3.2 Image Acquisition Using Sensor Strips

2.3.3 Image Acquisition Using Sensor Arrays

2.3.4 A Simple Image Formation Model

2.4Image Sampling and Quantization

2.4.1 Basic Concepts in Sampling and Quantization

2.4.2 Representing Digital Images

2.4.3 Spatial and Intensity Resolution

2.4.4 Image Interpolation

2.5 Some Basic Relationships between Pixels

2.5.1 Neighbors of a Pixel

2.5.2 Adjacency, Connectivity, Regions, and Boundaries

- 2.5.3 Distance Measures
- 2.6 An Introduction to the Mathematical Tools Used in Digital Image Processing
 - 2.6.1 Array versus Matrix Operations
 - 2.6.2 Linear versus Nonlinear Operations
 - 2.6.3 Arithmetic Operations
 - 2.6.4 Set and Logical Operations
 - 2.6.5 Spatial Operations
 - 2.6.6 Vector and Matrix Operations
 - 2.6.7 Image Transforms
 - 2.6.8 Probabilistic Methods
- Summary
- References and Further Reading
- Problems
- 3 Intensity Transformations and Spatial Filtering
 - 3.1 Background
 - 3.1.1 The Basics of Intensity Transformations and Spatial Filtering
 - 3.1.2 About the Examples in This Chapter
 - 3.2 Some Basic Intensity Transformation Functions
 - 3.2.1 Image Negatives
 - 3.2.2 Log Transformations
 - 3.2.3 Power—Law (Gamma) Transformations
 - 3.2.4 Piecewise—Linear Transformation Functions
 - 3.3 Histogram Processing
 - 3.3.1 Histogram Equalization
 - 3.3.2 Histogram Matching (Specification)
 - 3.3.3 Local Histogram Processing
 - 3.3.4 Using Histogram Statistics for Image Enhancement
 - 3.4 Fundamentals of Spatial Filtering
 - 3.4.1 The Mechanics of Spatial Filtering
 - 3.4.2 Spatial Correlation and Convolution
 - 3.4.3 Vector Representation of Linear Filtering
 - 3.4.4 Generating Spatial Filter Masks
 - 3.5 Smoothing Spatial Filters
 - 3.5.1 Smoothing Linear Filters
 - 3.5.2 Order—Statistic (Nonlinear) Filters
 - 3.6 Sharpening Spatial Filters
 - 3.6.1 Foundation
 - 3.6.2 Using the Second Derivative for Image Sharpening—The Laplacian
 - 3.6.3 Unsharp Masking and Highboost Filtering
 - 3.6.4 Using First—Order Derivatives for (Nonlinear) Image Sharpening—The Gradient
 - 3.7 Combining Spatial Enhancement Methods
 - 3.8 Using Fuzzy Techniques for Intensity Transformations and Spatial Filtering
 - 3.8.1 Introduction
 - 3.8.2 Principles of Fuzzy Set Theory
 - 3.8.3 Using Fuzzy Sets
 - 3.8.4 Using Fuzzy Sets for Intensity Transformations
 - 3.8.5 Using Fuzzy Sets for Spatial Filtering
- Summary
- References and Further Reading
- Problems
- 4 Filtering in the Frequency Domain
 - 4.1 Background
 - 4.1.1 A Brief History of the Fourier Series and Transform
 - 4.1.2 About the Examples in this Chapter

- 4.2 Preliminary Concepts
 - 4.2.1 Complex Numbers
 - 4.2.2 Fourier Series
 - 4.2.3 Impulses and Their Sifting Property
 - 4.2.4 The Fourier Transform of Functions of One Continuous Variable
 - 4.2.5 Convolution
- 4.3 Sampling and the Fourier Transform of Sampled Functions
 - 4.3.1 Sampling
 - 4.3.2 The Fourier Transform of Sampled Functions
 - 4.3.3 The Sampling Theorem
 - 4.3.4 Aliasing
 - 4.3.5 Function Reconstruction (Recovery) from Sampled Data
- 4.4 The Discrete Fourier Transform (DFT) of One Variable
 - 4.4.1 Obtaining the DFT from the Continuous Transform of a Sampled Function
 - 4.4.2 Relationship Between the Sampling and Frequency Intervals
- 4.5 Extension to Functions of Two Variables
 - 4.5.1 The 2—D Impulse and Its Sifting Property
 - 4.5.2 The 2—D Continuous Fourier Transform Pair
 - 4.5.3 Two—Dimensional Sampling and the 2—D Sampling Theorem
 - 4.5.4 Aliasing in Images
 - 4.5.5 The 2—D Discrete Fourier Transform and Its Inverse
- 4.6 Some Properties of the 2—D Discrete Fourier Transform
 - 4.6.1 Relationships Between Spatial and Frequency Intervals
 - 4.6.2 Translation and Rotation
 - 4.6.3 Periodicity
 - 4.6.4 Symmetry Properties
 - 4.6.5 Fourier Spectrum and Phase Angle
 - 4.6.6 The 2—D Convolution Theorem
 - 4.6.7 Summary of 2—D Discrete Fourier Transform Properties
- 4.7 The Basics of Filtering in the Frequency Domain
 - 4.7.1 Additional Characteristics of the Frequency Domain
 - 4.7.2 Frequency Domain Filtering Fundamentals
 - 4.7.3 Summary of Steps for Filtering in the Frequency Domain
 - 4.7.4 Correspondence Between Filtering in the Spatial and Frequency Domains
- 4.8 Image Smoothing Using Frequency Domain Filters
 - 4.8.1 Ideal Lowpass Filters
 - 4.8.2 Butterworth Lowpass Filters
 - 4.8.3 Gaussian Lowpass Filters
 - 4.8.4 Additional Examples of Lowpass Filtering
- 4.9 Image Sharpening Using Frequency Domain Filters
 - 4.9.1 Ideal Highpass Filters
 - 4.9.2 Butterworth Highpass Filters
 - 4.9.3 Gaussian Highpass Filters
 - 4.9.4 The Laplacian in the Frequency Domain
 - 4.9.5 Unsharp Masking, Highboost Filtering, and High—Frequency— Emphasis Filtering
 - 4.9.6 Homomorphic Filtering
- 4.10 Selective Filtering
 - 4.10.1 Bandreject and Bandpass Filters
 - 4.10.2 Notch Filters
- 4.11 Implementation
 - 4.11.1 Separability of the 2—D DFT
 - 4.11.2 Computing the IDFT Using a DFT Algorithm
 - 4.11.3 The Fast Fourier Transform (FFT)

4.11.4 Some Comments on Filter Design

Summary

References and Further Reading

Problems

5 Image Restoration and Reconstruction

5.1 A Model of the Image Degradation/Restoration Process

5.2 Noise Models

5.2.1 Spatial and Frequency Properties of Noise

5.2.2 Some Important Noise Probability Density Functions

5.2.3 Periodic Noise

5.2.4 Estimation of Noise Parameters

5.3 Restoration in the Presence of Noise Only—Spatial Filtering

5.3.1 Mean Filters

5.3.2 Order—Statistic Filters

5.3.3 Adaptive Filters

5.4 Periodic Noise Reduction by Frequency Domain Filtering

5.4.1 Bandreject Filters

5.4.2 Bandpass Filters

5.4.3 Notch Filters

5.4.4 Optimum Notch Filtering

5.5 Linear, Position—Invariant Degradations

5.6 Estimating the Degradation Function

5.6.1 Estimation by Image Observation

5.6.2 Estimation by Experimentation

5.6.3 Estimation by Modeling

5.7 Inverse Filtering

5.8 Minimum Mean Square Error (Wiener) Filtering

5.9 Constrained Least Squares Filtering

5.10 Geometric Mean Filter

5.11 Image Reconstruction from Projections

5.11.1 Introduction

5.11.2 Principles of Computed Tomography (CT)

5.11.3 Projections and the Radon Transform

5.11.4 The Fourier—Slice Theorem

5.11.5 Reconstruction Using Parallel—Beam Filtered Backprojections

5.11.6 Reconstruction Using Fan—Beam Filtered Backprojections Summary

References and Further Reading

Problems

.....

6 Color Image Processing

7 Wavelets and Multiresolution Processing

8 Image Compression

9 Morphological Image Processing

10 Image Segmentation

11 Representation and Description

12 Object Recognition

• • • • • ([收起](#))

[数字图像处理\(第三版\)\(英文版\) 下载链接1](#)

标签

CV

计算机

英语

评论

[数字图像处理\(第三版\)\(英文版\)_下载链接1](#)

书评

[数字图像处理\(第三版\)\(英文版\)_下载链接1](#)