Introduction

- What Is Digital Image Processing
- The Origins of Digital Image Processing
- Examples of Fields that Use Digital Image Processing
- Fundamental Steps in Digital Image Processing
- Components of an Image Processing System

Digital Image Fundamentals

- Elements of Visual Perception
- Light and the Electromagnetic Spectrum
- Image Sensing and Acquisition
- Image Sampling and Quantization
- Some Basic Relationships Between Pixels
- Linear and Nonlinear Operations
- Image Enhancement in the Spatial Domain
- Background
- Some Basic Gray Level Transformations
- Histogram Processing
- Enhancement Using Arithmetic/Logic Operations

Image Enhancement in the Frequency

- Introduction to the Fourier Transform and the Frequency
- Smoothing Frequency-Domain Filters
- Sharpening Frequency Domain Filters
- Homomorphic Filtering

Image Restoration

- Noise Models
- Restoration in the Presence of Noise Only–Spatial Filtering
- Periodic Noise Reduction by Frequency Domain Filtering

- Inverse Filtering
- Linear, Position-Invariant Degradations
- Estimating the Degradation Function

Color Image Processing

- Color Fundam
- Pseudocolor Image Processing
- Basics of Full-Color Image Processing
- Color Transformations
- Smoothing and Sharpening
- Color Segmentation

Wavelets and Multi resolution Processing

- Multi resolution Expansions
- Wavelet Transforms in One Dimension
- The Fast Wavelet Transform
- Wavelet Transforms in Two Dimensions

Image Compression

- Image Compression Models
- Elements of Information Theory
- Error-Free Compression
- Lossy Compression
- Image Compression Standards