15EEE337 Digital Image Processing

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Course Outcomes

- Understand the theory and basic principles of 2D signal
- Design filter parameters for basic image processing application
- Analyze time domain and frequency domain approaches for advanced image processing application.
- Develop programs for various digital image processing related problems

Syllabus

Unit 1

Introduction: Introduction and applications, Elements of Visual Perception, Image Sensing and Acquisition, Image Sampling and Quantization, representing digital pixels, image quality, introduction color image.

Image enhancement in spatial domain: Introduction to image enhancement, basic grey level transforms, Histogram, Histogram processing, Equalization, matching and color histogram, enhancement using arithmetic/logic operations, spatial filtering, smooth spatial filtering, sharpening spatial filtering

Syllabus

Unit 2

Image transform, Fourier transform, SHFT, DFT, FFT, DCT, Hadamard transform, wavelets transform (CWT, DWT), applications, other transforms.
Image enhancement in frequency domain: smoothing frequency domain filtering, sharpening frequency domain filtering, a model for image degradation/restoration process, noise model, noise model, mean filtering and filtering, estimating degradation function, inverse filtering, minimum mean square error (Weiner filter), color image smoothening, sharpening

Syllabus

Unit 3

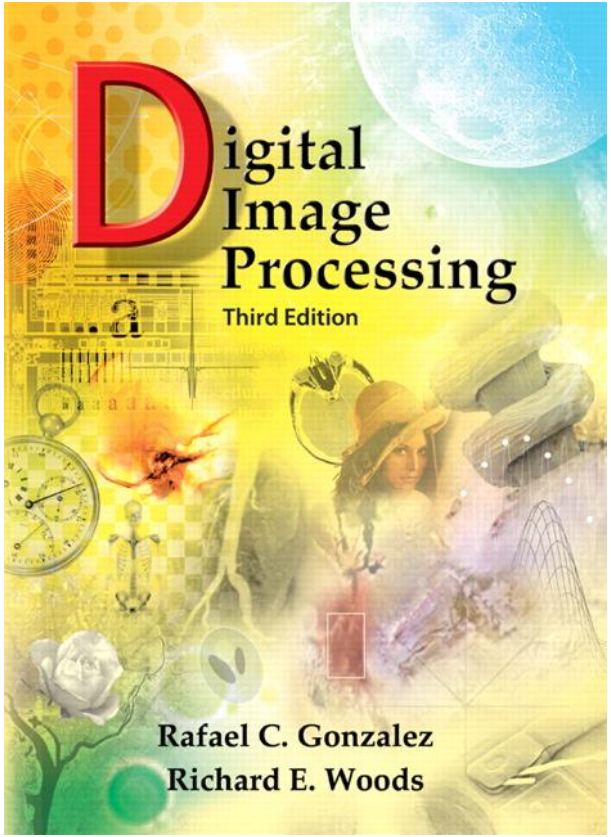
Segmentation and morphological operations: Segmentation and threshold function, different algorithms in thresholding, line detection, edge detection, edge linking by graph search method, Hough transform, region based Segmentation, matching, color segmentation, morphological -dilation and erosion, opening and closing, hit/miss transform, representation boundary descriptors, regional descriptors.

Evaluation Pattern

Component	Weightage	
Midterm Exam	30	10 online exam+20 viva
CA	20	Assignments+ quiz
End Sem	50	20 online exam+30 viva

Text Books

- Rafael C. Gonzalez and Richard E. Woods, “Digital Image Processing”, Third Edition, Pearson Education, 2008.



Implementation

THANK
YOU