

Math 155: General Course Outline

Catalog Description

155. Mathematical Imaging. (4) Lecture, three hours; discussion, one hour. Requisites: courses 32B, 33B, 115A, Program in Computing 10A. Imaging geometry. Image transforms. Enhancement, restoration, and segmentation. Descriptors. Morphology. P/NP or letter grading.

Textbook

R. Gonzalez and R. Woods, *Digital Image Processing*, Prentice-Hall.

Schedule of Lectures

Lecture	Section	Topics
1	2.2-2.3	Introduction: A Simple image model (2.2); Sampling and Quantization (2.3)
2	2.5	Imaging Geometry
3	3.1	Introduction to the Fourier Transform
4	3.2	The Discrete Fourier Transform
5	3.3	Some Properties of the Two-Dimensional Fourier Transform
6	3.3	Some Properties of the Two-Dimensional Fourier Transform
7	3.4	The Fast Fourier Transform
8	3.5	Other Separable Image Transforms
9	3.5	Other Separable Image Transforms
10	3.6	The Hotelling Transform
11	4.1	Image Enhancement
12	4.2	Enhancement by Point Processing
13	4.2	Enhancement by Point Processing
14	4.3	Spatial Filtering
15	4.4	Enhancement in the Frequency Domain
16	5.1	Image Restoration: Degradation Model
17	5.4	Inverse Filtering
18	7.1	Detection of Discontinuities
19	7.2	Edge Linking and Boundary Detection
20	7.3	Thresholding
21	7.4	Region-Oriented Segmentation
22	7.5	The Use of Motion in Segmentation
23	8.1	Representation Schemes
24	8.2	Boundary Descriptors
25	8.3	Regional Descriptors
26	8.4	Morphology
27	8.4	Morphology
28	8.4	Morphology

Comments

Outline update: L. Vese, 2/03

For more information, please contact Student Services, ugrad@math.ucla.edu.