

# **AMET-15 : DIGITAL IMAGE PROCESSING**

## **1. CONTINUOUS IMAGE MATHEMATICAL CHARACTERIZATION**

Image Representation, Two-Dimensional Systems, Two-Dimensional Fourier Transform, Image Stochastic Characterization

## **2. PSYCHOPHYSICAL VISION PROPERTIES**

Light Perception, Eye Physiology, Visual Phenomena, Monochrome Vision Model, Color Vision Model

## **3. PHOTOMETRY AND COLORIMETRY**

Photometry, Color Matching, Colorimetry Concepts, Tristimulus Value Transformation

## **4. IMAGE SAMPLING AND RECONSTRUCTION**

Image Sampling And Reconstruction Concepts, Image Sampling Systems, Image Reconstruction Systems

## **5. DISCRETE IMAGE MATHEMATICAL CHARACTERIZATION**

Vector-Space Image Representation, Generalized Two-Dimensional Linear Operator, Image Statistical Characterization, Image Probability Density Models, Linear Operator Statistical Representation

## **6. IMAGE QUANTIZATION**

Scalar Quantization, Processing Quantized Variables, Monochrome And Color Image Quantization

## **7. SUPERPOSITION AND CONVOLUTION**

Finite-Area Superposition And Convolution, Sampled Image Superposition And Convolution, Circulant Superposition And Convolution, Superposition And Convolution Operator Relationship

## **8. UNITARY TRANSFORMS**

General unitary transforms, fourier transform, cosine, sine, and hartley transforms, hadamard, haar, and daubechies transforms, karhunen-loeve transform

## **9. IMAGE ENHANCEMENT**

Contrast Manipulation, Histogram Modification, Noise Cleaning, Edge Crispening, Color Image Enhancement, Multispectral Image Enhancement

## **10. IMAGE RESTORATION MODELS**

General Image Restoration Models, Optical Systems Models, Photographic Process Models, Discrete Image Restoration Models

## **11. MORPHOLOGICAL IMAGE PROCESSING**

Binary Image Connectivity, Binary Image Hit Or Miss Transformations, Binary Image Shrinking, Thinning, Skeletonizing, And Thickening, Binary Image Generalized Dilation And Erosion, Binary Image Close And Open Operations, Gray Scale Image Morphological Operations

## **12. EDGE DETECTION**

Edge, line, and spot models, first-order derivative edge detection, second-order derivative edge detection, edge-fitting edge detection, luminance edge detector performance, color edge detection, line and spot detection

## **13. IMAGE FEATURE EXTRACTION**

Image feature evaluation, amplitude features, transform coefficient features, texture definition, visual texture discrimination