

Matlab & Image Processing

Workshop Course Contents

Day 1 (1st Session)

Introduction to MATLAB

- What is MATLAB
- The dominance of MATLAB over other languages
- Power of Matrix computations
- The application of MATLAB in various fields of engineering
- MATLAB Environment

Arithmetic Functions in MATLAB

- Matrixes and Vectors
- Creating Matrixes and VectorsMatrix Operation
- Array Operation
- Indexing Matrix
- Adding Elements to Vector or Matrix
- Various Flow Control used in MATLAB2D & 3D
- graphical Plotting

Day 1 (2nd Session)

Introduction to Image Processing

- What is Image Data
- Image Processing Toolbox
- Importing Image
- How to build a matrix image
- Image Display
- Image Operations
- Image Conversion

Image Arithmetic

- Adding Images
- Subtracting Images
- Multiplying Images
- Dividing Images
- Spatial Transformation
- Resizing Images
- Rotating Images
- Cropping Images

Image Filtration

- What is Image Restoration
- Noise and Images
- Noise Models
- Noise removal using spatial domain filtering
- Periodic noise
- Noise removal using frequency domain filtering

Day 2 (1st Session)

Morphological Image Processing

- **Mathematic Morphology**
- **Z2 and Z3**
- **Basic set theory**
- **Logic Operations**
- **Structuring Element**
- **How to describe Structuring Element**
- **Basic Morphological Operations**
- **Erosion**
- **Dilation**
- **Combining Erosion and Dilation**
- **Filtering Application**

Introduction to Graphical User Interface

Application and Demos

Day 2 (2nd Session)

Zonal Competition

After the hand on theory and practical experience from the workshop, Zonal Round Competition will be conducted for the participants.

Project to be covered

1. **2D & 3D Graphical Representation**
2. **Image Comparison**
3. **Image Pairing**
4. **Matrices Manipulation**
5. **Filtering of Noise**
6. **Red Object Detection**
7. **GUI Based Calculator**
8. **GUI Based Image Transforms**

Registration Fees: - 1200 per student only (The fees include training, Certification and event Registration and a free Matlab & Image Processing kit to each Group.)