Course Highlights

Digital image processing is the use of computer algorithms to perform image processing on digital images. Digital image processing has the same advantages over analog image processing as it allows a much wider range of algorithms to be applied to the input data, and can avoid problems such as the build-up of noise and signal distortion during processing.

Image processing operations can be roughly divided into three major categories, Image Compression, Image Enhancement and Restoration, and Measurement Extraction. Image compression is familiar to most people. It involves reducing the amount of memory needed to store a digital image.

Image defects which could be caused by the digitization process or by faults in the imaging set-up (for example, bad lighting) can be corrected using Image Enhancement techniques. Once the image is in good condition, the Measurement Extraction operations can be used to obtain useful information from the image.

Course Objectives

“Introduction to Digital Image Processing” is a two-day hands-on course that provides fundamental concepts and techniques for digital image processing and the software principles used in their practical implementation.

Course Benefits

Digital image processing allows one to enhance image features of interest while attenuating detail irrelevant to a given application, and then extract useful information about the scene from the enhanced image. This introduction is a practical guide to the challenges, and the hardware and algorithms used to meet them.

All mainstream topics to be covered include: image fundamentals, image enhancement in the spatial and frequency domain, restoration, 2-D Fourier transforms, linear and nonlinear filtering, morphological operations, noise removal, image de-blurring, edge detection, transformation and compression. It also introduces different methods used to extract features and objects within an image. The material will be illustrated with numerous examples of practical significance.

Who Must Attend

Researchers, Lecturers, Scientists, Engineers and Managers that would want to use or plan to use image processing, and to learn the fundamental knowledge in image processing with illustration using MATLAB.
Creating Innovative Solutions

Digital Image Processing®
Understanding the Fundamentals Concept & Techniques in MATLAB
A Two Days Practical Hands-On Workshop

### Course Agenda

**Fundamental of Images Processing**
- Exploring image types (Binary image, Intensity image, Indexed image, RGB image)
- Importing and exporting images
- Displaying the image (Single image, Multiple image frames)
- Finding image pixel values
- Calculating image statistics
- Converting image between Data Classes and Image Types

**Acquiring and processing Images**
- Connecting the hardware
- Retrieving hardware information
- Creating a video input object
- Configuring the video input object
- Previewing the video stream
- Acquiring the image data
- Viewing the acquired image

**Intensity transformation and mathematical Techniques**
- Histogram processing (Stretching, equalization, Statistic adjustment)
- Arithmetic operation to enhance images
  - Addition - increase brightness
  - Multiplication - increase sharpness
  - Subtraction - detect change
  - Division - detect change
  - Correcting image alignment: rotating
  - Cropping and resizing images

**Filtering Images**
- Processing an image as blocks
  - Block processing definition
  - Distinct block operations
  - Sliding neighborhood operations
- Performing image convolution & correlation
- Designing and implementing spatial domain filters
  - Smoothing and Sharpening
- Design and implementing frequency domain filters
  - High-pass, Low-pass, Band-pass
  - Ideal, Butterworth, Gaussian
- Processing the region of interest

**Image Restoration and Reconstruction**
- Reducing noise from images
  - Noise Modeling
  - Restoration in Presence of Noise
  - Periodic Noise Reduction
    by Frequency Domain Filtering
  - De-blurring images
  - Correcting background illumination

**Image Segmentation**
- Thresholding
- Point, Line and Edge Detection
  (Radon transform)
- Performing morphological segmentation
- Applying Region-based image segmentation

**Practical and application specific exercises, and case studies**

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### TERMS & CONDITIONS

Please note all price listed will be subjected to 6% Goods & Services Tax (GST ID No: 002118254/0M92). Confirmation letter and official Tax Invoice will be sent once application has been approved. Cheques should be crossed “A/C payee only” and be made payable to: Solutions 4U Sdn Bhd. You will be eligible for a full refund if a notice of cancellation is sent 2 weeks prior to the course commencement. For cancellation less than 2 weeks prior to commencement, no refund will be made. However, you may: (1) send a substitute or (2) transfer the registration to another training program designed to meet your learning needs. These include a full engineering and technical curriculum courses. S4U will also help your staff gain essential skill set through a variety of activities: Interactive seminars, practical workshop, hands-on training and enriching courses.

**Digital Image Processing**

**Date:** 18 & 19 APR 2019 (THU & FRI)

**Fees:** RM 2,200 per participant

- 10% discount for 3 concurrent registration

**How do you know about this training?**
- Referrals
- Direct Mail
- Newsletter
- Others

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**Compulsory Information:**

**Name:** Dr/Mr/Mrs/Ms ____________________________________________________________________________

(Please provide name in full, Certificate issued will be based on this name)

**Organization / Company:** ______________________________________________________________________

**Designation:** _______________________________________________________________________________

**Department:** _______________________________________________________________________________

**Mailing Address:** __________________________________________ Postcode: ____________________________

**Email:** __________________________________________ Handphone: _________________________________

**Telephone:** ________________________________ Fax: _______________________________

**Mode of Payment:**
- [ ] Cash
- [ ] Cheque
- [ ] Bank-In or Telegraphic
- [ ] Local Order (LO)

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Please fax or send this registration form to enquiry@solutions4u-asia.com

Solutions 4U Sdn Bhd
27-3C, Jalan Puteri 2/4, Bandar Puteri, 47100 Puchong, Selangor, Malaysia. Tel: (603) 8063 9300  Fax: (603) 8063 9400

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**Other relevant Courses**

- Uncover the Language of Technical Computing
- Artificial Intelligence (AI)
- Complete Guide to Business Analytics
- Traditional & AI Optimization
- Signal Processing and Filter Design
- Real Time Control Design to Implementation
- Uncover Multivariate Data Analysis
- Uncover Design of Experiments

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I hereby confirm my registration for the “Digital Image Processing” course at RM ____________ and declare that I have read and understood the terms and conditions below.

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Upon submission of the Registration Form, an invoice with bank details will be issued to request for payment. Registration fees must be prepaid by depositing full fee into our bank account or by issuance of a Local Order or Guarantee Letter by your Organisation to:

Solutions 4U Sdn Bhd

CIMB Bank Berhad, Klnara Branch
A/C No: 8003-546-044 (Alt No: 1276 000 1017055)

SWIFT CODE:CIBBMYKL

Authorized Signature and Organisational Stamp