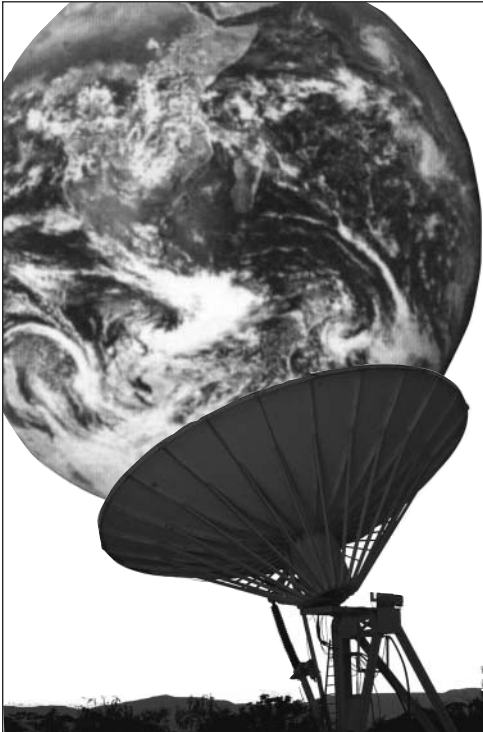

Practical

IMAGE PROCESSING AND APPLICATIONS



IN THIS WORKSHOP YOU WILL GAIN:

- An understanding of key issues in image processing
- A solid grounding in theory and concepts
- A thorough understanding of practical techniques
- Information for the implementation of techniques
- A summary of key applications

WHO SHOULD ATTEND:

- Geophysics Engineers
- Remote Sensing Engineers & Technicians
- Medical Technologists
- Chemists
- Electrical Engineers
- Electronic Engineers
- IT Personnel
- Computer Programmers
- Geologists & Biologists
- Astronomers
- Final Year Under-graduates & Postgraduate Students
- Physicists
- Applied Mathematicians
- Those involved in Research, Development & Data Analysis



Technology Training that Works

THE WORKSHOP

This Practical Image Processing and Applications workshop has been specifically designed to offer the delegates a highly practical and interactive workshop.

The workshop will be presented with an extensive usage of photographic slides, interactive examples and videos. The emphasis is on concepts and wide ranging applications, rather than dwelling on detailed mathematics, programming and particular software packages.

The workshop deliberately covers a wide range of material and is designed to provide efficient learning in a compact period of 2 days.

WORKSHOP OBJECTIVES

This highly practical workshop will offer you the most up-to-date information to:

- increase your confidence and versatility for the implementation of techniques in the workplace
- broaden your experience and understanding
- give you a solid grounding in image processing theory and concepts
- help you understand and implement practical techniques
- understand the key issues in image processing

PRACTICAL SESSIONS

This workshop has a strong practical emphasis, which will provide delegates with the confidence and experience required for the implementation of image processing.

ON-SITE TRAINING

- ✓ **SAVE** over 50% by having an IDC workshop presented at your premises.
- ✓ Customise the training to **YOUR** workplace.
- ✓ Have the training delivered when and where you need it.

Contact us for a **FREE** proposal.

THE PROGRAM

DAY ONE

INTRODUCTION

- overview
- effects of dramatic technological change
- art of image interpretation

OPTICAL IMAGE PROCESSING

- Fourier transform (FT) properties
- coherent and incoherent lens MTF
- filtering and inverse filtering
- template matching
- holography
- seeing problem, colour properties and the eye
- colour properties of image input & output devices
- film gamma

DIGITAL IMAGE PROCESSING BASICS

- Fourier series and sampling theory
- aliasing
- digital Fourier transform (DFT)
- fast Fourier transform (FFT) and other transforms
- measure of information content
- bits/pixel
- trade-offs
- demonstrations

DIGITAL IMAGE ENHANCEMENT

- histograms and look-up tables
- spatial and Fourier domain filtering
- principal components (PC) analysis
- Hough transform
- use of colour space: RGB, IHS, LUV, YUV
- colour coding
- region of interest processing
- masking and binary operations
- stereo display, shading and shadowing
- band ratioing and Kauth Thomas greenness transformation
- time difference, texture analysis and natural colour simulation
- noise analysis

DIGITAL IMAGE RESTORATION

- point spread function (PSF)
- blurring model
- deducing PSF's

DIGITAL IMAGE RESTORATION

- deconvolution problem
- Fourier domain techniques
- spatial domain techniques
- quantitative measure of restoration accuracy
- super resolution and use of symmetry
- the Fourier phase problem
- speckle interferometry and speckle holography
- image warping, interpolation and mosaicing
- pixel geometry and interpolation techniques
- general transforms and map projections
- ground control points (GCP's)
- distortions
- band registration
- stereo matching
- rotation using 1D operators
- registration, block processing and mosaicing

DAY TWO

IMAGE CLASSIFICATION

- ground truth
- parallelepiped
- Euclidean distance
- maximum likelihood
- 2D lookup
- interactive
- mixed pixels

IMAGE RECONSTRUCTION FROM PROJECTIONS

- projection theorem
- algorithm types

MACHINE VISION

- video systems
- lighting, polarisation, fluorescence
- monochrome, colour, thermal
- real-time processing
- morphological processing
- defect detection
- particle size analysis
- shape measurement
- speed detection
- counting
- range finders

COMMERCIAL SYSTEMS

- data formats
- image processing hardware and software
- discussion

IMAGE PROCESSING FOR REMOTE SENSING

- airborne
- satellite
- atmospheric effects
- digital terrain models (DTM's and Bathymetry)
- surveillance

IMAGE PROCESSING FOR GEOPHYSICS

- ground based techniques
- airborne
- satellite
- other data types including derived data types

MODELLING AND IMAGE PROCESSING

- forward and inverse
- electrostatics
- magnetostatics
- particle separators

3D VISUALISATION

- transparency
- VoxelView
- 3D seismic
- earthquake movies
- video examples