Image Processing and Applications: Module 4

Introduction:

Never before has the world of images around us changed so fast as over recent years, never before have we been exposed to so many different image worlds, and never before has the way in which images are produced changed so fundamentally. The scale of recent and current encroachment of media and technology into the workplace and work processes is a far greater upheaval than other epochs have known, and, obviously, it has also affected large areas of art.

Media artists today, represent a new type of artist, who not only sounds out the aesthetic potential of advanced methods of creating images and formulates new options of perception and artistic positions in this media revolution, but also specifically researches innovative forms of interaction and interface design, thus contributing to the development of the medium in key areas, both as artists and as scientists. Art and science are once more allied in the service of today’s most complex methods of producing images.

This module is envisaged to equip the student with the all round knowledge in the area of image processing, more specifically, digital image processing. The students are exposed to the scientific basis underlying the various technologies, tools and processes that need to be undertaken while working with digital images for various artistic pursuits as well as their use in web based technologies.

The module consists of lectures, seminars and studio experience, in a span of two weeks. The lectures cover the fundamentals of digital images. The seminars cover web technologies and integration and the studio covers the practical applications within application software.

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<td>Lectures</td>
<td>Dr. Aim Bannerjee, Dr. Suman Mitra, Dr. Nitin Raje</td>
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<td>Seminars</td>
<td>Dr. Nitin Raje</td>
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<td>Studio</td>
<td>Prof. Anirban Duttagupta</td>
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During the module, students work daily on various exercises to complete a task based workflow. Towards the end of the module they complete a comprehensive assignment that is expected to instill the sense of a closure. Details of each component follow.

Nitin Raje, Coordinator
LECTURES
2:30 PM MDES STUDIO

Lecture 1: Monday, Oct 15, 2007, Dr. Asim Bannerjee

Digital Image Characterization
  Image Representation – coding, Image Sampling – camera, scanners, medical imaging, Image Quantization concepts,

Human Vision
  Psychophysical Properties, Light Perception, Eye Physiology and Visual Phenomena, Monochrome and color Vision Models

Lecture 2: Wednesday, Oct 17, 2007, Dr. Nitin Raje

Photometry and Colorimetry

Lecture 3: Wednesday, Oct 19, 2007, Dr. Asim Bannerjee

Image Processing and Image Enhancement
  Superimposition and Convolution, Transforms – applications, Filtering – applications
  Brightness and contrast, Histogram based processing, Noise and cleaning, Edge sharpening, Concepts of color enhancement

Lecture 4: Monday, Oct 22, 2007, Dr. Nitin Raje

Introduction to Web technologies

Lecture 5: Wednesday, Oct 24, 2007, Dr. Suman Mitra

Geometrical Processing on Images
  Scaling, rotation, translation – linear, affine, Spatial Warping, Projective transforms – perspective, camera matching, Geometrical re-sampling

Lecture 6: Wednesday, Oct 26, 2007, Dr. Suman Mitra

Image Analysis and Security issues
  Discontinuities – edge detection, Feature extraction, Shapes
  Security aspects
STUDIO – Adobe Photoshop

1. Basics
   a. Overview, Selections, transformations, Color modes and models, brushes, tools
   b. Painting – focus – toning
   c. Design Exercise – composition and balance

2. Advanced Painting
   a. Layers – Masks – Paths
   b. Design Exercise – re-composition and enhancement - color

3. Filters
   a. Improvement – Art effects – Other
   b. Design Exercise – light and color

4. Text Effects
   a. Enhancements – Geometric transforms
   b. Advanced Special effects - add-ons
   c. Design Exercise – communication

5. Retouching and Enhancement
   a. Types of sources
   b. Compositing techniques
   c. Repair and restoration – tools and techniques
   d. Color retouching
   e. Design Exercises -

6. Printing procedure – Paper - Color indices
   a. Design Exercises -

7. ImageReady software and Web tools
   a. Design Exercise –

8. Web Design Techniques
   a. Website mockups – webpage layouts –
   b. Effects
   c. Design Exercise -

9. Comprehensive Design Exercise and portfolio
SEMINAR
2:30 PM MDES STUDIO

Seminar 1: Thursday Oct, 20, 2007
  Tba

Seminar 2: Tuesday, Oct 23, 2007
  Tba

  Tba