DIGITAL IMAGE PROCESSING

PROF. PRABIR KUMAR BISWAS
Department of Electronics and Electrical Communication Engineering
IIT Kharagpur

INTENDED AUDIENCE : BE/ME/MS/PhD

PRE-REQUISITES : Concepts of Digital Signal Processing

INDUSTRIES APPLICABLE TO : Defense labs like DRDO, Space ISRO, TCS

COURSE OUTLINE :

Digital image processing deals with processing of images which are digital in nature. Study of the subject is motivated by three major applications. The first application is in improvement of pictorial information for human perception i.e. enhancing the quality of the image so that the image will have a better look. The second is for autonomous machine applications which have wider applications in industries, particularly for quality control in assembly automation and many similar applications. This course will introduce various image processing techniques, algorithms and their applications.

ABOUT INSTRUCTOR :

Prof. Prabir Kumar Biswas completed his B.Tech(Hons), M.Tech and Ph.D from the Department of Electronics and Electrical Communication Engineering, IIT Kharagpur, India in the year 1985, 1989 and 1991 respectively. From 1985 to 1987 he was with Bharat Electronics Ltd. Ghaziabad as a deputy engineer. Since 1991 he has been working as a faculty member in the department of Electronics and Electrical Communication Engineering, IIT Kharagpur, where he is currently holding the position of Professor and Head of the Department. Prof. Biswas visited University of Kaiserslautern, Germany under the Alexander von Humboldt Research Fellowship during March 2002 to February 2003. Prof. Biswas has more than a hundred research publications in international and national journals and conferences and has filed seven international patents. His areas of interest are image processing, pattern recognition, computer vision, video compression, parallel and distributed processing and computer networks. He is a senior member of IEEE and was the chairman of the IEEE Kharagpur Section, 2008.

COURSE PLAN :

Week 1: Introduction and signal digitization

Week 2: Pixel relationship

Week 3: Camera models & imaging geometry

Week 4: Image interpolation

Week 5: Image transformation

Week 6: Image enhancement I

Week 7: Image enhancement II

Week 8: Image enhancement III

Week 9: Image restoration I

Week 10: Image restoration II & Image registration

Week 11: Colour image processing

Week 12: Image segmentation

Week 13: Morphological image processing

Week 14: Object representation ,description and recognition