DIGITAL IMAGE PROCESSING

PROF. PRABIR KUMAR BISWAS
Department of Electrical Engineering
IIT Kharagpur

TYPE OF COURSE : Rerun | Elective | UG/PG
COURSE DURATION : 12 weeks (20 Jul’20 - 09 Oct’20)
EXAM DATE : 17 Oct 2020

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:
Dr. 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 01 : Introduction and signal digitization
Week 02 : Pixel relationship
Week 03 : Camera models & imaging geometry
Week 04 : Image interpolation
Week 05 : Image transformation
Week 06 : Image enhancement I
Week 07 : Image enhancement II
Week 08 : Image enhancement III
Week 09 : Image restoration I
Week 10 : Image restoration II & Image registration
Week 11 : Colour image processing
Week 12 : Image segmentation, Morphological image processing, Object representation, description and recognition