About IIT Kharagpur

Kharagpur - a dusty town tucked away in the eastern corner of India, famous until 1950 as home to the longest railway platform in the world - became the nursery where the seed of the IIT system was planted in 1951. IIT Kharagpur started its journey in the old Hijli Detention Camp in Eastern India, where some of the country's great freedom fighters toiled and sacrificed their lives for India's independence. Spurred by the success of IIT Kharagpur, four younger IITs sprouted around the country in the two following decades, and from these five came thousands of IITians, the brand ambassadors of modern India. It was the success of this one institution at Kharagpur that wrote India's technological odyssey.

The Institute takes pride in its relentless effort to provide the best platform for both education as well as research in the areas of science and technology, infrastructure designs, entrepreneurship, law, management and medical science and technology. IITKGP is not just the place to study technology, it is the place where students are taught to dream about the future of technology and beam across disciplines, making differences enough to change the world.

Program Features/ Structure

Classroom lectures – **60%**

Numerical problem solving – **20%**

Hands-on work with different software - **20%**

Program Schedule and Venue

5 days, 29 June – 03 July 2020 (9:00 AM – 6 PM)

IIT Kharagpur – Department of Mining Engineering

Program Fee

Nil for TEQIP-III sponsored participants

For others :
INR 15000/- + GST 18% (for teachers and others)
INR 10000/- + GST 18% (for outside students)
INR 20000/- + GST 18% (for industry participants)

Who will benefit (Eligibility)

For TEQIP-III Institutes: Only faculty participants.
For others:
Teachers from Colleges/ Institutions/Universities.
Scientific Officers/ Instructors/ Technical Assistants/Research Scholars/Under Graduate and Post Graduate Students/ Participants from Industries.

Last day of Registration

05th
June 2020

Accommodation

Accommodation will be provided to the TEQIP-III sponsored participants at the Campus Guest house. For other participants, the same will be provided on chargeable basis as per rules.

How to Apply

Use the link: **https://erp.iitkgp.ac.in/CEP/courses.htm** to apply ONLINE.

Signup → Login → Profile Fillup → Choose a Program → Apply Now

Payment if applicable is to be done **ONLINE** after being short listed for the program.

Contact Us

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NPIU

TEQIP-KIT

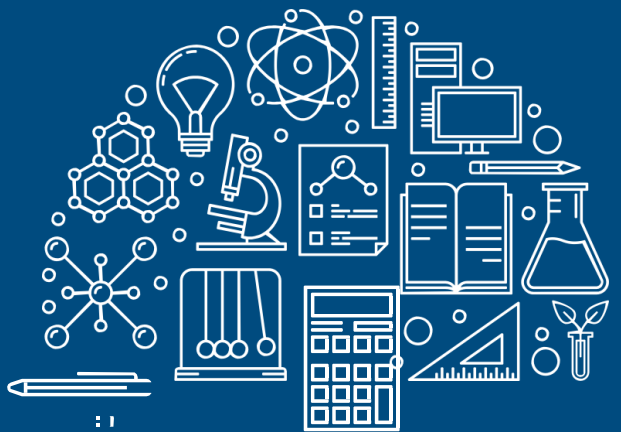
TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME FOR TEQIP KNOWLEDGE INCUBATION

NPIU - A Unit of MHRD, Govt of India for Implementation of World Bank Assisted Projects in Technical Education

Indian Institute of Technology Kharagpur

Deep Learning in 3D Reconstruction to Pattern Recognition

5 days
29 June – 03 July 2020



Introduction / Overview

Currently a lot of digital imaging systems have been developed which are much more capable of providing the details of the object space. These systems operate over large frequency ranges resulting in the generation of very high resolutions to better understand the scene.

Additionally, the advanced algorithms for processing the features for understanding the patterns prove to be promising to interpret the image more efficiently. While, it is important to appreciate the conflicting nature of the design goals in modern efficient and miniaturized systems which are used for the data capturing operations, the use of machine learning, deep learning and AI-based techniques provide efficient reduction in perception errors. A lot of open problems exist in these areas from different aspects of scientific, technological and commercializations points of view.

Program Objectives

The conventional digital image based operations lack in providing the details of the objects under consideration to the required level of details. The available features from spatial and spectral components are recently being used for better interpretation of the components of the objects. The awareness of the 3D structural aspects from the captured images also form the other aspect of image based prescription which have recently been used for any autonomous systems. The conditions of autonomy and intelligence is being tried to be obtained from the use of non-imaging and / or imaging sensors operating at frequencies. A lot of challenges lies in the processing of these data to obtain a better understanding of the scene in case of hetero-component images. In the proposed short term course the participants would be introduced to these upcoming areas of academics and research.

What you will learn

Program Content

Different types of digital images and their processing basics

Geometric image processing

Computer vision and scene perception

3D reconstruction

Pattern recognition and image understanding

Deep learning and AI for computer vision

Big Data Analytics for Hyperspectral Imaging and Understanding of the Spectral Signatures

Basics of Radar Imaging Concepts and their Processing

Applications of deep learning and big-data analytics for some case study examples

Hands-on session for some selected examples

Open research issues in these areas

Lab Experiments :

Operations with digital image data of different types like: optical, hyperspectral, radar

Feature extraction from these images, like statistical, spectral and others

Data Analytics approaches for pattern analysis

3D Image reconstruction based on captured images Use of basic DL based classifications on captured images

About the Faculty

Dr. D. Chakravarty

Prof. D. Chakravarty received his Bachelors in Mining Engineering in 1993 from Indian Institute of Technology, Kharagpur, Master of Technology in Mining Engineering in 1994 from the Indian Institute of Technology, Kharagpur and Ph.D. in 2001 from the same institute. Thereafter, he completed his postdoctoral from the Forschungszentrum Juelich, Germany working on Collaborative and Distributed Virtual Reality. He is currently Professor in the Department of Mining Engineering, Indian Institute of Technology, Kharagpur.

He is a TPC member and an invited / keynote speaker and chaired sessions in many national and international conferences and seminars. He is also in the review and editorial boards of many international journals.

He has been the recipient of many federal project grants in addition to research grants from the industry on the innovative sensor technology for use in adverse environment, especially for challenging environments.

He has also organized many short term lectures and workshops in the field of applied image processing, big-data analytics, AI and robotics that have been well attended by participants from both academia and industry.

He had been the recipient of the German Government Scholarship and is Senior Member, IEEE. He is also actively involved in the design and analysis of low-cost engineering systems for the generation of signals and innovative techniques for processing them. He has also published book chapters on hyperspectral image processing with applications.