

Short Term Course (STC)
on
Medical Image Processing & Analysis
(MIPA 2023)

Feb 22-26, 2023



Organized by
Computer Engineering Department
National Institute of Technology , Kurukshetra, IND

Preamble: In recent years, it is observed that the patients with chronic disease are increasing rapidly in India and abroad. At the same time developing countries like India have been struggling with deficient infrastructure in the form of a lack of well-equipped medical institutes. The availability of trained doctors is limited to urban areas, and both medical infrastructure and trained medical practitioners are scarce in the rural areas. There are many other areas also, where the Indian medical system is struggling, such as the shortage of efficient and trained manpower, unmanageable patient load, Public health policy and proactive healthcare, and expensive healthcare.

Medical image computing (MIC), sometimes also referred to as medical vision, is an interdisciplinary field at the intersection of computer science, data science including machine learning, electrical engineering, physics, mathematics, and medicine. Broadly speaking, the field focuses on the automatic processing of information in medical image data. Research in medical image computing typically involves algorithm innovation that relies on advanced strategies for mathematical modeling (e.g., geometrical, statistical, physical, functional, etc.) and inference (e.g., solving optimization problems).

Today, the area of automation is in its developing phase and it has a lot of applications in image-based medical diagnosis. Different chronic diseases such as cancer, cardiovascular disease, lung infections, etc. can be diagnosed with medical images using a learning-based system.

There are many modalities of images that have different applications for specific diseases. Typical problems and methods in medical image analysis include, but are not limited to, image reconstruction and compressed sensing, visualization, image enhancement, feature extraction, image segmentation, inter-study and inter-subject image registration, longitudinal and temporal studies, image-guided surgery and intervention, texture analysis, motion analysis, statistical shape analysis, spectral analysis, digital anatomical atlases, computational anatomy (modeling normal anatomy and its variations), virtual and augmented reality for therapy planning and guidance, telemedicine with medical images, telesurgery and image-guided medical robots.

In the area of automation, MIPA has a lot of applications in image-based medical diagnosis. Different chronic diseases such as cancer, cardiovascular disease, lung infections, etc. can be diagnosed with medical images using a learning-based system.

#STC Objectives:

The STC will deliver the key concepts among participants (Faculty, Industry Professionals, PhD./PG Scholars, etc) for designing the learning-based system for MIP and analysis (MIPA), as :

- Elementary concepts of Medical Image Processing.
- State-of-Art Frameworks: Medical Image Processing & Analysis.
- A use case of Computer-aided diagnosis ecosystems.
- Medical Informatics (*Concepts & Hands-on*): Current trends and Future roadmap.
- Medical Visualization (*Concepts & Hands-on*): Current developments & technological challenges.
- More Use-cases (*Theory & Hands-on*): Clinical Applications, etc

#Mode of STC:

STC will be in blended mode, where each participant to be presented physically at STC Venue for each session. Experts will engage the sessions in physical as well as in virtual mode. The sessions are planned to be delivered using both *Theoretical* as well as *Hands-on* Pedagogies on relevant topics. For a *Hands-on* session, Python and other tools are required. Though, prior knowledge of tools/Python programming is not mandatory.

Our Experts

- **Prof. B.V. Rathish Kumar**
Indian Institute of Technology, Kanpur, IND
 - **Dr. Anup Singh**
Indian Institute of Technology, Delhi, IND
 - **Dr Arnav Bhavsar**
Indian Institute of Technology, Mandi, IND
 - **Dr. Praveen Kumar**
National Institute of Technology, Kurukshetra, IND
 - **Dr. Anoop Kumar Patel**
National Institute of Technology, Kurukshetra, IND
- More resource persons from IITs, IIITs, NITs & other reputed Academic Institutions and**

Who Can Participate

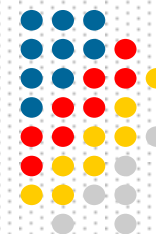
- Students/Research Scholars
Fee **Rs 1500/-**
- Academicians/Faculty Members
Fee **Rs 2000/-**
- Professionals/ Industry Persons
Fee **Rs 3000/-**

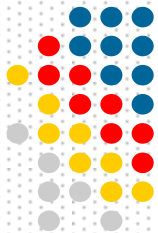
General Instructions

- The candidates are advised to visit STC website & complete the registration.
- The Registration Fee must be paid only through SBI Collect Payment.
- A participation certificate will be provided after successful completion of STC.

Last date of STC Registration

20 Feb, 2023 (9:00 pm)





Organizing Team

Patron

Prof. B. V. Ramana Reddy

Director, NIT Kurukshetra, IND

Convener

Prof. A. K. Singh

HOD, Computer Engg. Dept.,
NIT Kurukshetra, IND

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Registration Process

- [1] Visit the STC Website:
<https://sites.google.com/nitkkr.ac.in/mipa/home>
- [2] Complete the Fee payment, using SBI Collect Option.
<https://www.onlinesbi.sbi/sbicollect/collecthome.htm>
#Choose the mentioned values::
State: 'Haryana'
Type of Institute: 'Educational Institute'
Educational Institute Name: 'Director, National Institute of Technology, Kurukshetra'
Payment Category: 'MIPA2023'
- [3] Fill the Participation Registration Form (see in the STC Website).
- [4] Visit the STC web-site for more updates.



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* About

Computer Engineering Department

The department started offering B.Tech. Programme in Computer Engineering in 1987 with initial intake of 30 students and subsequently raised to 92. Department also started B.Tech programme in Information Technology (IT) in 2006 with present intake of 92 students. The department is proud to have a record of almost 100% placement for last 10 years. The department also offers two M.Tech. programs, one in Computer Engineering and other in Cyber Security. Department started Ph.D. program in 2002. Currently there are six sponsored projects undergoing in the department.

Faculty of the department have specialized areas for advanced studies and research in Distributed Computing, Software Engineering, Computer Networks, Database and Data Mining, Natural Language Processing, Information and Cyber Security, Image Processing.

The department is well equipped with state-of-the-art laboratories of all major domains of Computer Engineering and Information Technology with excellent intranet, servers, hardware and software support.

The Department's UG programs B. Tech Computer Engineering and Information Technology are NBA Accredited from Academic Year upto 2022-23 .



* About

National Institute of Technology, Kurukshetra

National Institute of Technology, Kurukshetra, one of the 31 NITs in the country, is a premier center of learning and research in various disciplines of Engineering and Management. It trains and develops high caliber professionals to serve not only the country but also the world at large. Established in 1963 as an REC, the college was elevated to a National Institute with Deemed University status in June 2002. The Institute has made rapid strides in expanding and upgrading facilities, enhancing the quality of education and strengthening the linkage with industry. The Institute has B.Tech, M.Tech, MBA and MCA Courses in various disciplines. Institute also offers excellent facilities for advanced research in the emerging areas of Science and Technology leading to Ph.D. degree.

The institute has well qualified and dedicated faculty along with finest supporting staff, laboratories and other infrastructure. The syllabus and the curriculum are constantly being updated to meet the growing demands and need of the day in different areas of technology. The infrastructure is geared to enable the Institute to turn out technical personnel of a high quality.