SPEAKERS

The sessions are handled by eminent experts from reputed academic institutes and industries. Some of the resource persons of the workshop are:

- Dr. Rama Rao Nidamanuri, IIST
- Dr. Sumohana S Channappayya, IITH
- Dr.Biplap Banerjee, IITB
- Er. Ujjwal Gupta, ISRO.
- Dr. Avik Bhattacharya, IIT B
- Dr. Shyam Lal, NITK
- Dr. Anil Kumar, IIRS, ISRO
- Er. Nagajyothi Kannan, ISRO

OBJECTIVES

- Exposing participants to the fundamental aspects of satellite image restoration and analysis.
- Providing adequate preliminary inputs to understand the concepts required for analyzing the theory behind the satellite data processing.
- Extending the theoretical concepts towards applications from various satellite imaging domain.
- Providing hands on exposure to some real-time satellite imaging applications, through assignments, demonstration etc.

REGISTRATION DETAILS

Registration Fee: Nil

Register at: https://forms.gle/gx3gMEvcSmRCkiYv6

Target audience: Faculty members and Research Scholars.

Maximum Number of Participants: 50

Certificate will be provided for registered participants only.

Prerequisite: Basic python programming and familiarization with Google Colab interface for hands on session.

COORDINATORS

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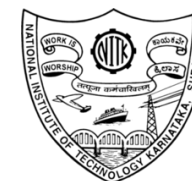
FDP on Satellite image analysis and applications using deep learning

(VIRTUAL MODE)

11 – 13 March 2021

Jointly Organized by:

Department of Mathematical and Computational Sciences

National Institute of Technology Karnataka, Surathkal, Mangaluru 575025
&

NIT Karnataka IEEE GRSS SBC

Sponsored by:

SERB- UNDER SSR SCHEME

OVERVIEW

In remote sensing, various sensors are used to record and receive the information of the objects without any physical contact. Mostly, the information of the objects is recorded by measuring its ability to reflect and transmit the electromagnetic energy from its surface. The images obtained from the sensors include the various artifacts such as blur, noise, contrast degradation etc. due to constructive and destructive interference of these reflected waves and various other factors. Hence, the analysis of the satellite images is necessary to understand the degradation process and design the appropriate restoration models. However, satellite image analysis poses a great challenge to the researchers due to high variability, low resolution and big data of the satellite images. The machine learning and deep learning tackle the challenges in handling the big data. These methods provide the potential applications in the field of the satellite image processing and analysis such as land use and cover, soil mapping, crop classification etc. For example, foresters use land cover mapping to identify the forest cover, to identify the possible routes etc. The advantages of the deep learning methods include the ability to handle the high dimensional data and to map classes to the complex characteristics of the satellite images. However, implementing the deep learning methods is not straight forward, the literature provides the conflicting advice for the different key issues. The proposed FDP provides the sessions on satellite image analysis, various satellite image degradations and restoration methods using the deep learning. It highlights many applications of remote sensing. The purpose of this FDP is to provide an intensive understanding of how to use the deep learning algorithms and to equip the participants with the tools and hands on sessions for solving the practical problems in the satellite imaging domain.

ABOUT MATHEMATICAL AND COMPUTATIONAL SCIENCES

National Institute of Technology Karnataka, Surathkal is located in Mangalore City, Karnataka State, India. The Institute was established as Karnataka Regional Engineering College (KREC) in 1960, and upgraded as National Institute of Technology Karnataka (NITK) in 2002.

The Department of Mathematical and Computational Sciences started along with the institute (1960). The department initially catered to the needs of the UG and PG Engineering Mathematics and subsequently, in 1988-89, introduced two PG programmes, namely, the Master of Computer Applications (MCA) and Master of Technology (M.Tech.). The PG Programme, Master of Technology (M.Tech.) in Computational Mathematics (CMA) is replaced with Master of Technology (M.Tech.) in Computational and Data Science (CDS) since 2019.

MACS Department is known for its variety of courses in the areas of Algebra, Analysis, Applied Mathematics and Statistics. People from across the country come and enroll to the PhD program with faculties having expertise in the areas of Computational Systems, Nonlinear Analysis, Functional Analysis, Number Theory & Cryptography, Numerical Analysis, Graph Theory, Optimization, Fluid Dynamics, Computer applications, Image processing and many more.

SCHEDULE -Tentative

Day 1: 11-03-2022

- Inaugural Session at 9 AM.
- 9:30 AM – 11:00 AM: Introduction to remote sensing.
- 11:15 AM – 12: 45 PM: Introduction to image quality metrics.
- 2:00 PM – 3:30 PM: Overview of satellite image analysis.
- 3:45 PM – 5:00 PM: Hands-on programming session.

Day 2: 12 – 03-2022

- 9:30 AM – 11:00 AM: An overview of Hyper-spectral image analysis.
- 11:15 AM – 12: 45 PM: Analysis of Synthetic Aperture Radar (SAR) Data.
- 2:00 PM – 3:30 PM: Introduction to remote sensing/Geo-science tools.
- 3:45 PM – 5:00 PM: Hands-on programming session.

Day 3: 13-03-2022

- 9:30 AM – 11:00 AM: Fuzzy machine / Deep learning models application for Geo-spatial technologies.
- 11:15 AM – 12: 45 PM: Deep learning models for satellite image processing.
- 2:00 PM – 3:30 PM: Satellite and remote sensing image restoration.
- 3:45 PM – 4:00 PM: Valedictory function.