BigAI for BigGIS

Generative AI (GenAI),Self-supervised learning (SSL) and Quantum Computing (QC) approaches for Earth Observation

December 08 – 12, 2025

INDIAN INSTITUTE OF REMOTE SENSING
Indian Space Research Organization
Department of Space, Government of India
Dehradun-248001, Uttarakhand
https://www.iirs.gov.in/

INTRODUCTION

BigGIS refers to the integration of large-scale geographic information systems with big data technologies to manage and analyze vast amounts of geospatial data. This includes data from numerous Earth observation satellites and close-range collection techniques such as LiDAR and mobile devices. As data collection outpaces consumption, integrating AI techniques for BigGIS (BigAI) becomes critical to effectively tackle the challenges it presents. Innovations such as self-supervised learning (SSL), quantum computing (QC), and generative AI (GenAI) enhance data processing and interpretation while providing new strategies for domain adaptation and transfer learning.

OBJECTIVE

The prime objective of this course is to explore the integration of Big geographic information systems (BigGIS) focused on large scale AI innovations like quantum computing, generative AI and self-supervised learning (SSL) techniques. Participants will learn how these cutting-edge techniques enhance geospatial data analysis, addressing the challenges posed by increasing data collection and using large AI with smaller datasets.

EXPECTED OUTCOME

- Understanding BigGIS and BigEO data challenges
- Explore the foundational principles of image understanding and BigGIS data handling
- Understanding BigAI enabled Geospatial Foundational Models (GFMs).
- Adapting SSL, QC, GenAI techniques for EO and Geospatial application.
- Realtime Case Study implementation GIS domain

TARGET PARTICIPANTS

This course is primarily meant to train working professional from govt. organizations, non-govt. organizations, universities and educational institutions, entrepreneurs and researchers in remote sensing domain with adequate programming skills.

ELIGIBILITY

Completed Graduate degree in Engineering, Urban Planning, Forestry, Agriculture, Computer Science, Data Science, Remote Sensing, GIS, Earth Science, Water Resources, Environmental Science, or equivalent

OR

Pursuing/Competed Post-graduate degree or PhD program in the Technology/Application domain of EO/GIS

OR

Working in Technology/Application of EO/GIS areas related to Natural Resource Management, Environment Monitoring, Disaster Management and similar fields.

We aim to have a diverse group of participants with adequate representations from academia, research institutions and industries. Accordingly, preference will be given to people closely working in the field of machine learning for Earth Observation.

TECHNICAL PREREQUISITES

- Working Knowledge Cloud processing platform.
- Knowledge of basic Deep Learning concepts and image processing
- Experience with Python NumPy and PyTorch libraries will be added advantages.

COURSE DURATION AND STRUCTURE

The course will be of 5 days duration in IIRS campus and consists of ~40% lecture Hands on experience (~40%) and Case study (~20%).

HOW TO APPLY

Interested candidates are required to fill up the online application form available in IIRS website (https://admissions.iirs.gov.in/)

About IIRS

Indian Institute of Remote Sensing (IIRS) is a premier institute with a primary aim to build capacity in Remote Sensing and Geoinformatics technologies and their applications through training & education, research and outreach programmes.

IIRS is a Unit of Indian Space Research Organisation (ISRO), Department of Space, Government of India. Formerly known as Indian Photo- Interpretation Institute (IPI), founded in 1966, the Institute is the first of its kind in entire South-East Asia.

IIRS is one of the most sought after institutes for conducting specially designed courses for the officers from the Ministries of the Government of India and State Governments for effective use of Earth Observation (EO) data from satellites for the benefit of society. Ministry of External Affairs, Government of India has recognised IIRS to conduct international training courses for the participants from ITEC (Indian Technical & Economic Cooperation) Member countries in Asia, Africa, Latin America, Central and Eastern Europe, and several Pacific and Caribbean nations.

IIRS also hosts the headquarters of the Centre for Space Science & Technology Education in the Asia and Pacific (CSSTEAP), affiliated to the United Nations, and conducts its training and education courses in RS & GIS.

LOCATION & ACCESSIBILITY

Indian Institute of Remote Sensing (IIRS) is located in Dehradun, the capital city of the State of Uttarakhand, at a distance of about 260 km from Delhi and is well- connected by air, rail and road. The city is famous for its picturesque landscape, pleasant climate, high quality school education and is the gateway to several places of religious and tourist importance, such as Haridwar, Rishikesh, Mussoorie, etc.

ACCOMMODATION

Participants will be provided accommodation in the IIRS hostel during the course, with the option of additional two days for check-in or check-out. All hostel rooms are well furnished and are allotted on single/double occupancy basis. Local candidates will be considered for hostel accommodation, only if available. Indian cuisine is served in the hostel mess.

Note: The expenditure towards boarding, lodging will have to be borne by the participants as actual rates of IIRS. Travel to IIRS has to be managed by participants.

COURSE FEE

Application Fee: **Rs.500**

Course fee: **Rs.6500**

NUMBER OF SEATS

Total of 25 seats

(Indian nationals only)

IMPORTANT DATES

Start date to apply: **Aug. 01, 2025**

Last date to apply: ~~**Oct 19,2025**~~ **Nov. 03, 2025**

Announcement of selection list:

~~**Oct 29,2025**~~ **Nov. 07, 2025**

Course start date: **Dec. 08, 2025**

Course completion date: **Dec. 12, 2025**

For more information and further clarification, please write to:

Dr. Vandita Srivastava Head & Scientist/Engineer "SG" Geoinformatics Department	Indian Institute of Remote Sensing, Department of Space, Govt. of India, 4, Kalidas Road, Dehradun - 248001, Uttarakhand Tel:0135-2524124 , Fax: 0135-2741987 Email: sc_gid@iirs.gov.in
Ashutosh Kumar Jha Scientist/Engineer "SF" Geoinformatics Department Course Director	Indian Institute of Remote Sensing, Department of Space, Govt. of India, 4, Kalidas Road, Dehradun - 248001, Uttarakhand Tel:0135-2524134 , Fax: 0135-2741987 Email:akjha@iirs.gov.in