

CSSTEAP Short Training Course on



07 – 18 December, 2026
(Online Mode)

DEEP LEARNING BASED APPLICATION OF SAR DATA

FOR
OBJECT DETECTION
AND **OIL SPILLS IN OCEANS**



SAR Fundamentals
& Image Formation



Deep Learning
Models &
Architectures



Object Detection
Using DL Models
(YOLO, Faster R-CNN etc.)



Oil Spill Detection &
Characterization
Using DL

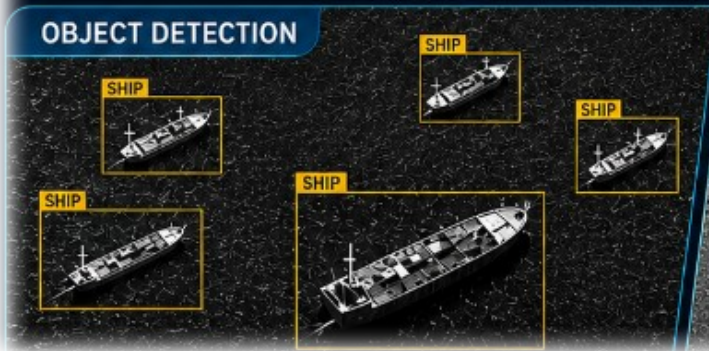


Performance
Evaluation &
Visualization

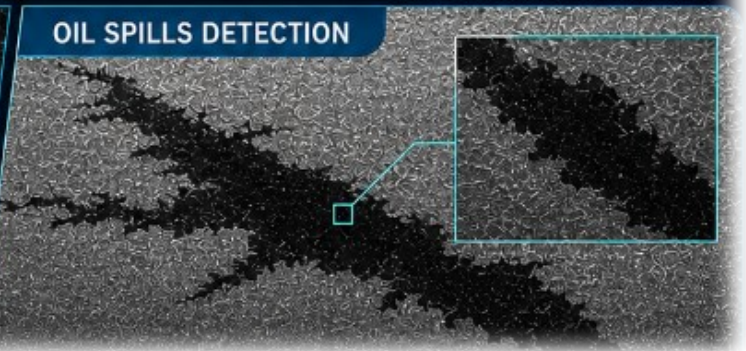


Hands-on Labs
with Real SAR
Datasets

OBJECT DETECTION



OIL SPILLS DETECTION



**Last date for online
registration
20 November 2026**

Organised By



Centre for Space Science and Technology Education
in Asia and the Pacific (CSSTEAP)
(Affiliated to the United Nations)
www.cssteapun.org



Conducted By

nrsc

National Remote Sensing Centre
Indian Space Research Organization (ISRO)
Hyderabad, India
www.nrsc.gov.in

Background

Synthetic Aperture Radar (SAR) has emerged as one of the most powerful Earth observation technologies due to its ability to capture high-resolution images under all weather conditions, both day and night.

With recent advances in Artificial Intelligence (AI) and Deep Learning (DL), SAR image analysis has become faster, more accurate, and highly automated. Deep learning techniques have shown remarkable success in applications such as ship and object detection, oil spill monitoring, flood mapping, maritime surveillance, and environmental monitoring, enabling timely and reliable decision-making.

About CSSTEAP and NRSC

CSSTEAP was established in India in November 1995 with its headquarters at Dehradun and over the past 30 years, the Centre has emerged as a Centre of Excellence in capacity building in the field of space science and technology applications. For more information, visit www.cssteapun.org.

The National Remote Sensing Centre (NRSC), located in Hyderabad, is one of the major centres of the Indian Space Research Organisation (ISRO). The Centre is engaged in the acquisition, processing, dissemination, and application of satellite remote sensing data for natural resource management, disaster management, environmental monitoring, agriculture, urban planning, and geospatial information services.

NRSC has made significant contributions to several national and international Earth observation programs by providing satellite data products, geospatial services, and decision-support systems. For more information on NRSC, visit www.nrsc.gov.in.

Course Objectives

This course provides a comprehensive understanding of Synthetic Aperture Radar (SAR) data and deep learning techniques for Earth observation applications. It covers the fundamentals of SAR remote sensing, SAR image characteristics, data preprocessing, deep learning models for object detection and segmentation, oil spill monitoring, performance evaluation, and hands-on analysis using real-world SAR datasets for practical geospatial applications.

Faculty and Medium of Instruction

The core faculty is drawn from NRSC and premier institutes of India. Some faculty from reputed institutes outside India may be invited, depending upon their availability. They have rich experience in the fields of satellite remote sensing, Artificial Intelligence, and Deep Learning. The medium of instruction shall be in English.

Course Content

1. Fundamentals of SAR Remote Sensing and SAR Image Interpretation

- SAR Principles, Imaging Geometry & Radar Backscatter
- SAR Image Characteristics, Signatures & Interpretation

2. SAR Data Pre-processing and AI-Ready Dataset Generation

- SAR Calibration, Speckle Filtering & Terrain Correction
- Dataset Preparation, Annotation & Augmentation

3. Deep Learning for SAR Image Analysis and Object Detection

- CNN, Transformer & Foundation Models for SAR
- Object Detection, Segmentation & Model Evaluation

4. Deep Learning-Based Ship and Maritime Object Detection from SAR

- Ship Detection using YOLO, CNN & Transformer Models
- Maritime Object Classification & Performance Assessment

5. SAR-Based Oil Spill Detection and Classification

- Oil Spill Signatures & SAR Image-Based Detection
- Deep Learning for Spill Segmentation & Classification

6. Advanced Deep Learning, GeoAI and End-to-End SAR Applications

- GeoAI, Multimodal Learning & SAR Foundation Models
- End-to-End SAR Applications, Deployment & Case Studies

Eligibility and Selection Procedure

- The course is intended for researchers, scientists, engineers, faculty, students, and professionals in Remote Sensing, GIS, AI, Geospatial Technologies, Ocean Applications, and Disaster Management.
- Nomination forwarded through Governing Board Members, Embassies, or Head of their respective Institute/ Organization/ Institution is mandatory.
- The course will be conducted in English; proficiency is required.
- Basic knowledge of Python programming is preferred.

Important Dates

Announcement of Course : **15 September 2026**

Last Date for registration : **20 November 2026**

Two sessions each on alternate days will be conducted for six days at a suitable time considering the major participating countries.

Number of seats : 50-100

How to apply

- Eligible candidates can apply online through the CSSTEAP website:
<https://admissions.cssteapun.org>
- The Incomplete applications will not be considered for selection.

Course Director

Dr. P. Manjusree

Group Head,

Advanced Analytics and Compute Infrastructure Group

Remote Sensing Applications Area

NRSC | ISRO | Dept. of Space

Course Coordinator

Dr. Subrat Kumar Acharya

Head, Advanced Analytics Division(AA&CIG)

Remote Sensing Applications Area

NRSC | ISRO | Dept. of Space

Programme Coordinator

Dr. Stutee Gupta

Training Education & Outreach Group

Management System Area

NRSC | ISRO | Dept. of Space

**For any course related queries
please contact**

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