**ONLINE SHORT COURSE**

**ON**

**"Fuzzy Machine Learning and Deep Learning for Remote Sensing Data Classification"**

**Organized By**          **Conducted By**

**Through: Virtual Platform**
**November, 20-24, 2023**

**Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP)**
**(Affiliated to the United Nations)**
**IIRS Campus, 4, Kalidas Road, Dehradun, India**
**www.cssteapun.org**

**Indian Institute of Remote Sensing (IIRS)**
**Indian Space Research Organisation (ISRO)**
**Department of Space, Government of India**
**4, Kalidas Road, Dehradun, India**
**www.iirs.gov.in**
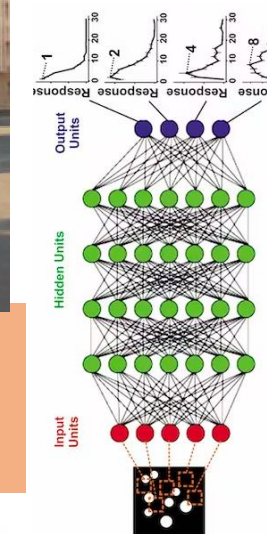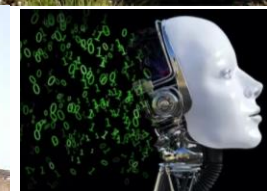
## INTRODUCTION

Earth observation satellites launched over past few decades provide periodically synoptic and systematic information pertaining to land, ocean and atmosphere. This information is a key ingredients in the programmers of government towards management of natural resources. With upcoming machine learning algorithms natural resources can be managed using earth observation data. As this incredible form of artificial intelligence is already being used in various industries and profession like; Image and Speech Recognition, Medical Diagnosis, Prediction, Classification, Learning Associations, Statistical Arbitrage, Extraction, Regression. Today we're looking at all these Machine Learning Applications for remote sensing data.

## ABOUT CSSTEAP AND IIRS

CSSTEAP was established in India in November 1995 with its headquarters in Dehradun and over the past 27 years, the center has emerged as a Centre of Excellence in capacity building in the field of space science and technology applications. The 1st campus of the Centre was established at Dehradun, India and is hosted by Indian Institute of Remote Sensing (IIRS). CSSTEAP has been imparting training and educational programmes related to RS&GIS, Satellite Communication, Satellite Meteorology, Space Science, Global Navigation Satellite Systems, and Small Satellite Mission, helping participants in developing research skills through its Master Degree, Post Graduate and Certificate programms.

IIRS (established in 1966), a constituent unit of Indian Space Research Organization (ISRO), is a key player for training and capacity building in geospatial technology and its applications through training, education and research in South east Asia. The training, education and capacity building programmes of the Institute are designed to meet the requirements of professionals at working levels, fresh graduates, researchers, academia, and decision makers

## OBJECTIVE OF THE COURSE

This training cum workshop introduces several fundamental concepts and methods for machine learning. The objective is to familiarize the audience with machine learning algorithms, techniques and their applications, as well as general questions related to analyzing and handling large remote sensing data sets. Several software libraries and data sets publicly available will be used to illustrate the application of these algorithms.

## COURSE CONTENTS

**Day 1**
Earth Observation data sets and applications; Machine Learning - A Journey; Methods in Machine Learning; Fuzzy concept in machine learning.

**Day 2**
Fuzzy based temporal remote sensing data processing; Neural Networks.

**Day 3**
Deep Learning-CNN and RNN models for object detection

**Day 4**
Generative Adversarial Deep Networks for Remote Sensing Images.

**Day 5**
Google Engine: Other Machine Learning Models and Algorithms

## LEARNING OUTCOMES

This course will provide understanding about fuzzy machine and deep learning models and their applications in remote sensing data processing.

## ELIGIBILITY AND HOW TO APPLY

Master's Degree in science or Bachelor's degree in engineering or equivalent qualification relevant to the course objectives with at least 03 years of experience in teaching/research or professional experience in the field of geospatial technology, computer science, geography, mathematics, software development and related fields.

For candidates with higher qualifications, the minimum experience may be relaxed. Basic knowledge in mathematics and / or statistics is essential. The course will be conducted in English language, the candidate should have proficiency in English language.

Applicants are requested to register online by opening the admissions portal at www.cssteapun.org or https://admissions.cssteapun.org/login. They are advised to read each and every instruction before applying online https://admissions.cssteapun.org/uploads/cssteap_online_short_course.pdf .The application should be <u>duly forwarded</u> by the Head of the applicant's organization for consideration. There is no course fee for applicants applying through proper channel. Link for lectures will be shared with selected applicants in due course. Applicants are advised to check the website/portal www.cssteapun.org regularly for further updates/information

**Announcement of course: August 23, 2023**
**Last date for receipt of application November 1, 2023.**

## COURSE CONTACT DETAIL

Dr. Anil Kumar
(Course Director )
(**Email**: anil@iirs.gov.in; Ph: +91-135-2524114)

Mr. Vinay Kumar
(Course Coordinator)
(**Email**: vinaykumar@iirsddn.ac.in; Ph: +91-135-254115)

Indian Institute of Remote Sensing
4, Kalidas Road, Dehradun-248001,
Uttarakhand, India