Institute of Electrical and Electronics Engineers(IEEE)
Joint Chapter of CIS/GRSS, Hyderabad Section in collaboration with
GRSS Chapter, Bangalore Section
Presents

GRSS Distinguished Lecturer's talk on
ARTIFICIAL INTELLIGENCE FOR EARTH OBSERVATION
By
MIHAI DATCU
GERMAN AEROSPACE CENTER DLR, GERMANY

Date: 30 July 2021, Friday

Link to join:

https://ieeemeetings.webex.com/ieeemeetings/onstage/g.php?MTID=e4f7a92b7c9e365ded08435126838cbe6

Time: 6pm – 7pm (Indian Standard Time)

9am -10am Boston time

REGISTRATION FEE : NIL

Chapter Leadership:

Hyderabad Chapter

CIS/GRSS Jt. Chapter Chair:
Mousmi Ajay Chaurasia
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Bangalore Chapter

GRSS Chapter Chair:
Jaya Sreevalsan Nair
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Abstract:

Artificial Intelligence (AI) for Earth Observation (EO) is largely an interdisciplinary field. The lecture presents selected topics of AI algorithms specific for EO encompassing: orbit, mission, sensor networks, intelligent agents, communication, coding, signal processing, machine learning, deep learning, data indexing, data bases, network theories, simulation, modeling, inverse problem, model assimilation, or parameters retrieval. Recently the quantum resources are evolving and a paradigm shift is at the horizons of next few years. EO starts with the mission intelligence. Orbit determines the acquisition time therefore latently includes physical parameters of the Erath surface, illumination, atmospheric effects. The mission intelligence, i.e. satellite constellations with intelligent orbits can enhance overall the EO performance. And formation flying is boosting the performance with the sensor intelligence, as new configurations of apertures, supported by advanced signal processing and resulting in completely new instruments.

To practically implement the Artificial Intelligence techniques, a current trend in Big Data processing is to bring the algorithms to the data on the cloud, instead of downloading large datasets and running algorithms on local servers. EO instead, is demanding more advanced paradigms, as: bring the algorithms to the sensor. The sensor is the source of the Big Data, and the lecture is analyzing the methods of computational imaging to optimize the EO information sensing. The presentation is focusing on the most advanced methods in synthetic aperture, coded aperture, compressive sensing, ghost imaging, and also the basics of quantum sensing. The overall theoretical trends are summarized in the perspective of practical applications.

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Brief Bio:

MIHAI DATCU (Fellow, IEEE) received the M.S. and Ph.D. degrees in electronics and telecommunications from the University Politehnica of Bucharest (UPB), Bucharest, Romania, in 1978 and 1986, respectively, and the habilitation a Diriger Des Recherches degree in computer science from the University Louis Pasteur, Strasbourg, France, in 1999.,Since 1981, he has been a Professor with the Department of Applied Electronics and Information Engineering, Faculty of Electronics, Telecommunications and Information Technology, UPB. Since 1993, he has been a Scientist with the German Aerospace Center (DLR), Wessling, Germany. He has held Visiting Professor appointments with the University of Oviedo, Spain, the University Louis Pasteur and the International Space University. He is a Senior Scientist and the Data Intelligence and Knowledge Discovery Research Group Leader with the Remote Sensing Technology Institute, DLR, and delegate in the DLR-ONERA Joint Virtual Center for AI in Aerospace.,Dr. Datcu is member of the ESA Working Group Big Data from Space and Visiting Professor withe ESA's Φ-Lab. He was the recipient the National Order of Merit with the rank of Knight, for outstanding international research results, awarded by the President of Romania, in 2008, and the Romanian Academy Prize Traian Vuia for the development of the SAADI image analysis system and his activity in image processing, in 1987, and of the Chaire d'excellence internationale Blaise Pascal 2017 for international recognition in the field of data science in earth observation. He has served as a Co-organizer for international conferences and workshops and as Guest Editor for a special issues on AI and Big Data of the IEEE and other journals. He is a representative of Romanian in the Earth Observation Program Board (EO-PB).