

Registration

- No Registration Fee
- Register via
<https://forms.gle/HfcK6gLtfbK9DiZMA>
- Registration Deadline:
25 Sept 2022
- Notification due:
26 Sept 2022
- Online link will be shared with registered candidates

Organizers



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**IEEE GRSS
Kolkata Chapter**

2022 International Workshop on

***Remote Sensing
and
Societal Applications***

Organised by

IEEE GRSS Kolkata Chapter

**28-29 September
2022**

Co-sponsored by

IEEE Young Professionals



Speakers



Jaya Sreevalsan Nair
Senior Member, IEEE
Senior Member, ACM
Associate Editor, IEEE Transactions on
Circuits and Systems for Video Technology
Chair, IEEE Geoscience and Remote Sensing
Society (GRSS) Bangalore Section
IIT Bangalore, India (jnair@iiitb.ac.in)
**Lecture Title: Probabilistic Analysis
Using Ensemble Methods in
Geoscientific Applications**
[28 - Sep - 2022 @ 10 am IST]



Ronny Hänsch
Senior Member, IEEE
Editor-in-chief for the GRSS e-Newsletter
Chair, IEEE Geoscience and Remote Sensing
Society (GRSS) Image Analysis and Data
Fusion (IADF) Technical Committee
Associate editor for IEEE Geoscience and
Remote Sensing Letters
German Aerospace Center (DLR), Germany
(rww.haensch@gmail.com)
Lecture Title: Remote Sensing of Floods
**[28 - Sep - 2022 @ 01:30 pm IST (10 am
CEST)]**



Vincenzo Piuri
Fellow, IEEE, Distinguished Scientist, ACM
Associate Editor, IEEE Transactions on
Cloud Computing
IEEE Region 8 Director-elect (2021-22)
Editor-in-Chief of the IEEE Systems Journal
(2013-19) (vincenzo.piuri@unimi.it)
**Lecture Title: Artificial Intelligence for
Environmental Applications**
28 - Sep - 2022 @ 2:45 pm IST
(11:15pm CEST)]



Manuel Roveri
Senior Member, IEEE
Associate Editor, IEEE Transactions on Emerging
Topics in Computational Intelligence
Associate Editor, IEEE Transactions on Artificial
Intelligence
Associate Editor, Neural Network Journal, Elsevier
Associate Editor, IEEE Computational Intelligence
Magazine
Polytechnic University of Milan, Italy
(manuel.roveri@polimi.it)
**Lecture Title: Tiny Machine Learning: from the lab
to field (and back)**
29 - Sep - 2022 @ 2:30 pm IST (11 am Italy time)]



Houbing Song
Senior Member ACM, Senior Member IEEE
Distinguished Speaker, ACM
Embry-Riddle Aeronautical University
(Houbing.Song@erau.edu)
**Lecture Title: Real-Time Machine Learning for
Quickest Detection**
29 - Sep - 2022 @ 6:30 pm IST (9am Miami time)]

Lecture Details

Inauguration of the Workshop

[28 - Sep - 2022 @ 9:30 am IST]

Special Invitee:

Prof. Ashish Ghosh, FIAPR, Past Chair, IEEE GRSS Kolkata Section, Indian Statistical Institute, Kolkata, India.

Probabilistic Analysis Using Ensemble Methods in Geoscientific Applications

by **Jaya Sreevalsan Nair**, IIIT Bangalore, India

[28 - Sep - 2022 @ 10 am IST]

In several spatial data applications across several domains, including geoscience, we encounter the need to use validation from the data itself given the absence of ground truth. Uncertainty in the data that manifests in several analytical operations must also be derived from the data itself, in several cases. Thus, ensemble methods have been a useful tool in understanding spatial data better. In this talk, we look at such methods for probabilistic geometric classification of airborne LiDAR point clouds, and probabilistic flood extent estimation from SAR images.

Remote Sensing of Floods

by **Ronny Hänsch**, German Aerospace Center (DLR), Germany

[28 - Sep - 2022 @ 01:30 pm IST (10 am CEST)]

The frequency and intensity of natural disasters (i.e. wildfires, storms, floods) has increased over recent decades. Extreme weather can often be linked to climate change, and human population expansion and urbanization have led to a growing risk. In particular floods due to large amounts of rainfall are of rising severity and are causing loss of life, destruction of buildings and infrastructure, erosion of arable land, and environmental hazards around the world. Expanding urbanization along rivers and creeks often includes opening flood plains for building construction and river straightening and dredging speeding up the flow of water. In a flood event, rapid response is essential which requires knowledge which areas are affected or at risk and which parts of the infrastructure are still accessible. Remote sensing plays a pivotal role obtaining this information to predict flood risk, detect flooded areas, monitor the development of floods, and perform damage assessment. This talk highlights several corresponding challenges and presents state of the art approaches to address them.

Artificial Intelligence for Environmental Applications

by **Vincenzo Piuri**, University of Milan, Italy

28 - Sep - 2022 @ 2:45 pm IST (11:15pm CEST)]

Adaptability and advanced services for protection of the environment requires ability to adjust the understanding of the current status by considering the natural dynamics of the environment itself and the natural phenomena. Artificial intelligence can provide additional flexible techniques for designing and implementing monitoring and control systems both for environmental applications, which can be configured from behavioral examples or by mimicking approximate reasoning processes to achieve adaptable systems. This talk will analyze the opportunities offered by artificial intelligence technologies to support the realization of adaptable operations and intelligent services in environmental monitoring, especially for pollution monitoring, land management and agriculture.

Tiny Machine Learning: from the lab to field (and back)

by **Manuel Roveri**, Polytechnic University of Milan, Italy

29 – Sep – 2022 @ 2:30 pm IST (11 am Italy time)]

The “computing everywhere” paradigm (comprising Internet-of-Things and Edge Computing) will pave the way for a pervasive diffusion of Tiny Machine Learning (TinyML) in everyday life. To fully address this challenge TinyML solutions must become deeper, hence encompassing the deep-learning paradigms being the state-of-the-art in many recognition and classification applications, and wider, hence being able to operate in a collaborative and federated way within an ecosystem of heterogenous technological objects. This talk explores the solutions and methodologies to make TinyML deeper and wider by also describing real-world TinyML-based systems for environmental and structural health monitoring.

Real-Time Machine Learning for Quickest Detection

by **Houbing Song**, Embry-Riddle Aeronautical University

29 – Sep – 2022 @ 6:30 pm IST (9am Miami time)]

Quickest detection, which refers to real-time detection of abrupt changes in the behavior of an observed signal or time series as quickly as possible after they occur, is essential to enable safety, security, and dependability of cyber-physical systems (CPS). Real-Time Machine Learning (RTML) has the potential to achieve quickest detection. However, Machine learning lacks the necessary mathematical framework to provide guarantees on correctness. The integration of machine learning with quickest detection not only creates new research opportunities with major societal implications, but also poses new research challenges in safety, security, and dependability. In this lecture, I will present a comprehensive survey of existing literature in the emerging area of real-time machine learning for quickest detection, identify the challenges, and evaluate the trends. I will also introduce our research findings in this area.

Valedictory Session

[29 – Sep – 2022 @ 7:45 pm IST]

Special Invitee:

Prof. Susmita Ghosh, Chair, IEEE GRSS Kolkata Section, Jadavpur University, India.