Indian Institute of Space Science and Technology
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The Use of Artificial Intelligence for Earth and Space Observation: Principles and Limitations

A Colloquium by **Prof. M. Van Droogenbroeck,**
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03:30 PM | **04** FEBRUARY **2026** | IIST Council hall

Abstract: Artificial intelligence (AI) has become an important tool in computer vision, with recent advances driven largely by deep learning, enabled by large datasets and increased computational power. AI techniques are widely used to automate the analysis of large volumes of visual data through tasks such as object detection, segmentation, temporal event localization in videos, and 3D novel-view synthesis. Several AI paradigms can be applied to these vision tasks. While supervised learning is the most common approach, it relies on large amounts of annotated data, which are often unavailable in Earth and space observation. This limitation motivates the use of alternative AI paradigms.

This presentation will introduce AI strategies suitable for scenarios with limited labeled data, illustrated through applications such as building damage assessment from satellite imagery and exoplanet detection using direct imaging. It is based on an original scientific framework developed at the VIULab, structured around three key pillars: data, method, and evaluation. The talk will conclude with a discussion of the limitations of AI and a brief presentation of the VIULab.

About the Speaker: M. Van Droogenbroeck received his PhD from UCLouvain in 1994 and is currently a Full Professor at the University of Li è ge. His background includes research at the School of Mines of Paris and leadership roles at Belgacom and the ISO/MPEG Committee. His work specializes in real-time computer vision, notably the development of the ViBe algorithm, and deep learning applications ranging from exoplanet detection to AI for sports analysis and novel-view synthesis.

Live Stream: https://tinyurl.com/2p8c4wmx