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Department of Computer Science
August 19, 2025, at 11:00 a.m.



COLLOQUIA ON ALGORITHMS AND LEARNING

The Department of Computer Science University of Salzburg

invites to the talk

by

Dr. Naveen Chandra

on Tuesday, August 19, 2025, at 11:00 a.m.

in the Lecture Hall T01,
Jakob-Haringer-Straße 2

Host: Univ.-Prof. Sebastian Forster

Deep Learning and Remote Sensing for Landslide Hazard Mapping: Advances, Applications, and Opportunities

Abstract:

Landslide hazard mapping has seen significant progress with the integration of deep learning and remote sensing technologies. Among the most effective approaches are object detection models from the YOLO family, which, when enhanced with attention mechanisms such as CBAM, ECA, SA, and GAM, demonstrate exceptional capabilities in identifying and localizing landslides across diverse and complex terrains. These mechanisms improve the model's ability to extract and prioritize critical spatial features from high-resolution satellite and UAV imagery, leading to greater detection accuracy and speed. Empirical evaluations using open-source datasets confirm the performance of these attention-augmented models through key metrics such as precision, recall, F-score, and mean average precision (mAP). Notably, configurations like YOLOv5n+CBAM and YOLOv10m+CBAM deliver robust results. Complementing these object detection models, dynamic semantic segmentation networks, particularly U-Net, achieve enhanced performance when integrated with backbone architectures like ResNet and DenseNet, improving the depth and quality of feature extraction for pixel-wise landslide mapping. These advancements underscore the transformative potential of combining multisource remote sensing data with advanced computer vision techniques for scalable, data-driven disaster risk reduction. The session will further highlight the importance of interdisciplinary collaboration across geoinformatics, computer science, and environmental sciences to develop robust, AI-driven solutions for landslide detection and environmental hazard monitoring. This talk will appeal to a wide audience interested in artificial intelligence, geospatial technologies, and climate-related risk management.

About Dr. Naveen Chandra:

Dr. Naveen Chandra is a Scientist at the Wadia Institute of Himalayan Geology (WIHG), Dehradun. His research focuses on the application of machine learning and deep learning techniques for landslide detection and hazard assessment using multi-source remote sensing data. He holds a Ph.D. from the Indian Institute of Technology Roorkee (2018), an M.Tech. from the Indian Institute of Technology Bombay (2012), and a B.Tech. in Computer Science and Engineering.

Before joining WIHG, he served as an Assistant Professor under the TEQIP-III program at Uttarakhand Technical University. He currently leads a research project sponsored by the Department of Science and Technology and is the Principal Investigator of an ASEAN-India collaborative R&D project.

Dr. Chandra has been awarded several prestigious fellowships, including the INSA Visiting Scientist Programme (IIT Indore), the Paired Early Career Fellowship (PECFAR 2025) at Leibniz University Hannover, and the Scientist in Residence Fellowship (2025–2026) at Paris Lodron University of Salzburg, Austria. He has authored publications in leading peer-reviewed journals, presented at international conferences, and serves as an active reviewer for several international journals in the fields of remote sensing, geospatial artificial intelligence, and natural hazard analysis.