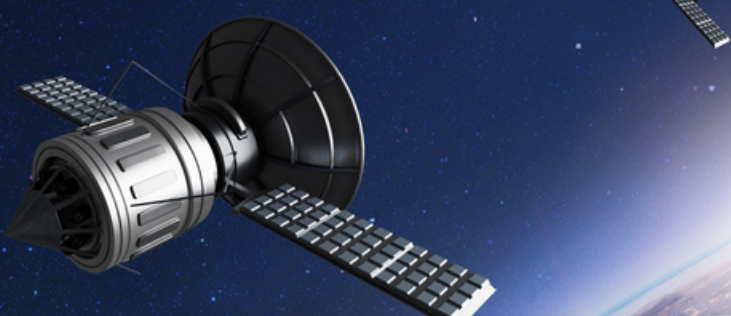




LSGS & RILS RESEARCH SEMINAR

Decoding Landslides with Data and Artificial Intelligence

 **12 AUG 2026 (WED)**

 **10:30 - 11:30**

 **Z414, POLYU**

 **ENGLISH**

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ABSTRACT

Data-driven methods are increasingly transforming the analysis, mapping and forecasting of mass movements. This presentation reviews recent advances in artificial intelligence applied to landslide detection, characterisation and prediction across different spatial and temporal scales. Deep-learning architectures are used to rapidly segment failures from optical and SAR Earth-observation data, while global datasets and lightweight models improve geographical transferability and computational efficiency. Multi-temporal mapping provides information on landscape evolution and changing controls on slope instability. Three-dimensional topological analysis further enriches conventional inventories by supporting the classification of movement types and the separation of detachment, transport and deposition zones. Machine-learning methods are also applied to InSAR and ground-monitoring time series for the classification, clustering and forecasting of slope deformation. Spatial susceptibility modelling, recurrent neural networks, graph-based representations and models trained on numerical simulations illustrate complementary approaches to forecasting. Particular attention is given to data leakage, uncertainty, model generalisation and physically consistent validation. Finally, explainable and neurosymbolic AI are discussed as essential steps towards transparent, trustworthy and operational geohazard assessment.

BIOGRAPHY

Prof. Filippo Catani is Full Professor of Engineering Geology at the University of Padova, where is Director of the Machine Intelligence & Slope Stability Laboratory, and President of the BSc Programme in Earth and Climate Dynamics. He holds appointment as Chair Associate of the UNESCO Chair on the Sustainable Management of Geohydrological Risks, and serves on the Executive Committee of the Italian Branch of IAEG. Ranked among the world's top 1% most influential scientists, his research focuses on geohazards, landslide forecasting, remote sensing, and artificial intelligence for Earth system monitoring, modelling, and analysis.

Moderator: Prof. Guoqiang SHI, Assistant Professor of LSGS, member of RILS

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