GRID Newsletter Q4 2026

October 13, 2026

Welcome to the Q4 Newsletter!

Dear readers,

Q3–Q4 2026 has been a period of intense mobility and dissemination for GRID. Emilio Bilotta (UNINA) delivered a keynote at the ICGdR World Congress in Hong Kong and completed a four-week secondment at Tongji University with visits to four Chinese universities. UniPD's Francesca Ceccato taught Anura3D at Tongji; Leeds's Lei Chen explored ML for global lake seasonality at BOKU and HDAnalytics; a workshop on AI in geotechnics at Sapienza University; two further secondments at UniSafe. A new paper on the Pore Radius Propagation approach was published in *Computers and Geotechnics*, six new partners joined via a Grant Agreement Amendment, and the Kaggle Competition is ongoing. Stay on the GRID!

Cheers,

Enrico Soranzo
GRID project coordinator

Bilotta (UNINA) at PolyU and Tongji



Emilio Bilotta delivering a keynote at the First ICGdR World Congress, Hong Kong Polytechnic University.

From 8 Aug to 9 Sep 2026, Emilio Bilotta (UNINA) carried out secondments at Hong Kong Polytechnic University (hosted by Prof. Zhen-Yu Yin) and Tongji University. At PolyU, embedded in the First ICGdR World Congress, he delivered a keynote on earthquake-induced damage to tunnel linings in tectonically active zones and co-chaired Session 7. At Tongji, the four-week secondment focused on shallow tunnelling and monitoring-informed back-analysis, extending a deterministic framework towards physics-informed Bayesian updating. Through Tongji's High-End Foreign Expert Program, Bilotta also visited Guizhou, Chongqing Jiaotong, Xi'an Jiaotong and Beijing University of Technology.



Concluding GRID seminar at Tongji University, 7 September 2026.

Ceccato and Sun (UniPD) at Tongji



Francesca Ceccato and Xinglai Sun at Tongji University, Shanghai.

Francesca Ceccato and PhD candidate Xinglai Sun from the University of Padua — a new GRID beneficiary — completed their secondment at Tongji University in Shanghai. Francesca delivered presentations on advanced geotechnical modelling and ML for geohazard assessment, and taught a hands-on Anura3D course to Tongji's doctoral students. Special thanks to Prof. Dongming Zhang, Prof. Jie Zhang, Prof. Mingliang Zhou and Dr Meng Lu.

Lei Chen (Leeds) at BOKU and HDAnalytics



Lei Chen during his secondment at BOKU.

Lei Chen from the University of Leeds completed a three-month secondment at BOKU and HDAnalytics, building on his research *Machine learning revealing changes in the seasonality structure of global lakes*. The visit assesses global lake seasonality patterns (2001–2023) using satellite data, lake ice, hydrological extremes and climate forcing, with an interpretable ML model to identify the dominant drivers of these changes.

Soranzo at Sapienza Workshop and UniSafe



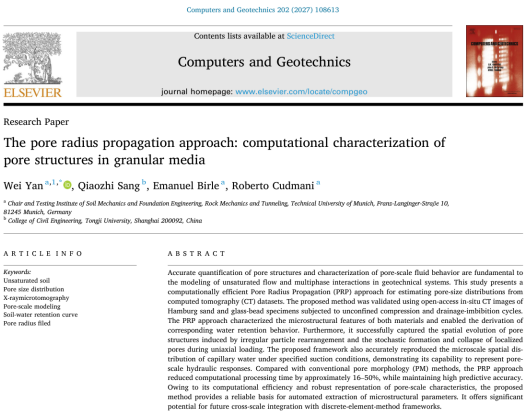
Enrico Soranzo at the workshop on AI and Geotechnical Engineering, Sapienza University of Rome.

Enrico Soranzo participated in a workshop on "AI and the evolution of Geotechnical Engineering" at Sapienza University of Rome, organised by the Italian Geotechnical Association (AGI). He also completed two secondments at UniSafe (hosted by Prof. Paolo Simonini), working on AI agents for geotechnics, GGU Connect/grai access management, Kaggle competition coordination, and his **keynote** at LeiGS2026, the symposium on the digital future in geotechnics, in Leipzig.



Soranzo during his secondment at UniSafe, University of Padua.

Paper Spotlight: Pore Radius Propagation Approach


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Research Paper

The pore radius propagation approach: computational characterization of pore structures in granular media

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ABSTRACT

Accurate quantification of pore structures and characterization of pore-scale fluid behavior are fundamental to the modeling of unsaturated flow and multiphase interactions in geotechnical systems. This study presents a computationally efficient Pore Radius Propagation (PRP) approach for estimating pore-size distributions from computed tomography (CT) datasets. The proposed method was validated using open-access in-situ CT images of Hamburg sand and glass-bead specimens subjected to unconfined compression and drainage-imbibition cycles. The PRP approach characterized the microstructural features of both materials and enabled the derivation of corresponding water retention behavior. Furthermore, it successfully captured the spatial evolution of pore structures induced by irregular particle rearrangement and the stochastic formation and collapse of localized pores during uniaxial loading. The proposed framework also accurately reproduced the microscale spatial distribution of capillary water under specified suction conditions, demonstrating its capability to represent pore-scale hydraulic responses. Compared with conventional pore morphology (PM) methods, the PRP approach reduced computational processing time by approximately 16–50%, while maintaining high predictive accuracy. Owing to its computational efficiency and robust representation of pore-scale characteristics, the proposed method provides a reliable basis for automated extraction of microstructural parameters. It offers significant potential for future cross-scale integration with discrete-element-method frameworks.

Title page of the paper, published in *Computers and Geotechnics* (2026).

A new GRID-affiliated paper in *Computers and Geotechnics* introduces the **Pore Radius Propagation (PRP)** approach — a computationally efficient method to estimate pore-size distributions from computed tomography (CT) datasets. Roberto Cudmani and colleagues at TUM, with Tongji University, validated it on open-access in-situ CT images of Hamburg sand and glass beads under unconfined compression and drainage–

imbibition cycles. The framework reproduced the microscale spatial distribution of capillary water and cut processing time by 16–50% versus conventional pore-morphology methods.

For further info, please see: Wei Yan, Qiaozhi Sang, Emanuel Birle, Roberto Cudmani, The pore radius propagation approach: computational characterization of pore structures in granular media, Computers and Geotechnics, 2026.

Automating Core Logging with ML at BOKU



Daniel Ryghseter (NGI) presenting at BOKU.

As part of the GRID project, NGI's Daniel Ryghseter presented a **machine-learning-based approach** to automating core logging for jet grout columns. Aimed at students, researchers and professionals, the class covered fundamentals of core logging, preparation and processing of core images, ML methods for automated feature recognition, data annotation, model training and validation, integration into geotechnical project documentation — and the opportunities and limitations of automation in engineering practice.

12 October 2026, 10:00, Simonyhaus, Peter-Jordan-Strasse 65, Vienna.

Project Updates

New partners via GAMD. A Grant Agreement Amendment was finalized, officially welcoming UniPD, UniSafe, SmartG, HPC, OsloMet and Tongji as new partners in the project.

Kaggle Competition. The GRID Kaggle Competition ($500 prize, predict soil grain size distributions from images) is ongoing — directly stemming from GRID's WP5 research.

Upcoming Events

Catch up with GRID at these upcoming events:

- **Online:** Nov 4, 13:00 EET
  NG² Knowledge Hub — ML soil classification
- **Leipzig:** Nov 12–13
  LeiGS2026 — **Soranzo keynote**
- **Hybrid:** Nov 25
  DAFNI workshop — **keynote**

Spotlight on Research

Our recent publications include:

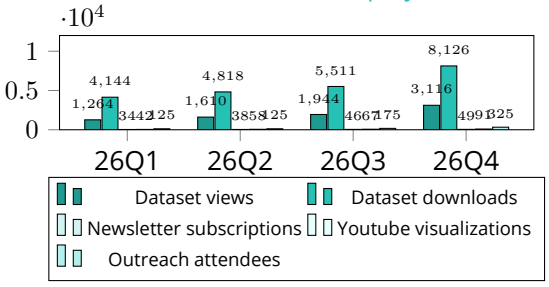
The pore radius propagation approach: computational characterization of pore structures in granular media
Computers and Geotechnics, 2026.

Revisiting strain localization from the view of structured inhomogeneity
Computers and Geotechnics, 2026.

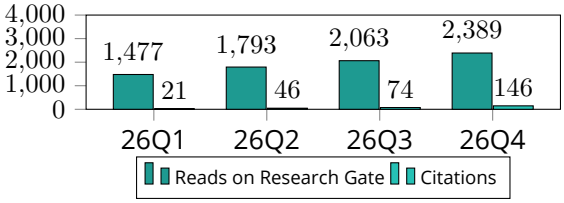
Strength of a cement-improved clay and a machine learning evaluation of interactions between observed mechanical behaviours
Geoscience Frontiers, 2026.

Engaging the Community

Communication KPIs of the GRID project



Dissemination KPIs of the GRID project



Get Involved

Join us in revolutionizing geotechnics and AI. Visit our website at grid.boku.ac.at.

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