

CATCH UP WITH GRID

Explore our research

Dive into the scientific production of GRID with our project publications listed on the [website](#).

Access our databases

Data is the backbone of machine learning. Explore the consortium's datasets available on [Zenodo](#).

Watch and listen

Check out our videos and podcasts on GRID's [YouTube channel](#).

Stay informed

Subscribe to our [quarterly newsletter](#) to keep up with the latest project updates.

Join Our Events

Participate in our outreach activities, including the European Researchers' Night in Austria, Italy, Germany, and Portugal.

GRID DATA SCIENCE COMPETITION

Join our thrilling six-month data science competition, where both internal and external participants, especially young talents, will compete in making machine learning predictions on a geotechnical dataset prepared by the consortium.

Scheduled timeline

Initial announcement	November 2025
Deadline for submission	May 2026
Winning announcement	July 2026
Prize ceremony	October 2026 at ICITG

POLICY DOCUMENTS

PARTNERSHIP

The consortium consists of 12 international partners at the forefront of geotechnical engineering and machine learning, including geotechnical software, tunnel monitoring and AI providers. The project is led by BOKU.



GRID

Geotechnical Resilience through Intelligent Design

Horizon Europe MSCA Staff Exchanges
(2024-2028)

MORE INFORMATION

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<https://www.youtube.com/@GRID-Proj>



<https://zenodo.org/communities/gridrecords>



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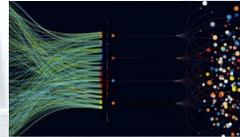
ABOUT GRID

GRID is a four-year initiative (2024-2028) funded by the Horizon Europe Programme, focused on transforming geotechnical engineering by integrating physics and machine learning to address the compounded challenges of uncertainty, heterogeneity, and non-linearity due to climate change. The project aims to develop advanced intelligent design strategies for resilient infrastructure, utilising cutting-edge machine learning techniques and extensive datasets. Led by BOKU, the consortium consists of 12 expert partners, each contributing specialised knowledge to tackle the project's multifaceted challenges, ultimately striving for zero-carbon goals and enhanced infrastructure resilience.

OBJECTIVES

- **Combine physics-based principles** with machine learning to address uncertainty, heterogeneity, and non-linearity in geotechnical engineering.
- **Fortify critical infrastructures** against climate change, ensuring long-term sustainability.
- Leverage extensive datasets and cutting-edge algorithms to **improve the accuracy and efficiency** of geotechnical analyses.
- Foster collaboration among partners **from academia and industry** to tackle the multifaceted challenges of geotechnical engineering with an **interdisciplinary approach**.
- Train a **new generation of geotechnical engineers** with advanced skills, empowering them to achieve zero-carbon goals and effectively address climate-related threats.

METHODOLOGY



1. Gather and **standardise datasets** for ML model development. Exploring advanced sensor technologies for on-site data acquisition.
2. Develop methods to effectively quantify and **manage uncertainties** inherent in geotechnical engineering processes.
3. Utilise **GenAI techniques** to optimise design processes, leading to more resource-efficient solutions in geotechnical projects.
4. Implement **PINNs** to enhance the fidelity of geotechnical simulations by integrating physical principles into ML models.
5. Tailor machine learning solutions for geotechnical challenges encountered in the construction and management of **geoinfrastructures** (tunnels, tailing dams) and **geohazards** (landslides, earthquakes).
6. Improve the **interpretability and transparency** of machine learning models to ensure that decisions are understandable and trustworthy for geotechnical practitioners.

TIMELINE

		WP1	WP2	WP3	WP4	WP5	WP6
2024	Q4	◆					
	Q1	◆					
2025	Q2						
	Q3		Workshop at NGI (ISGSR)				
2026	Q4						
	Q1						
	Q2		Summer school at TUM				
2027	Q3						
	Q4		Workshop at UNINA				
	Q1						
	Q2						
2028	Q3						
	Q1						
	Q2						
	Q3						

IMPACT

- Training multidisciplinary researchers, and exposing them to applications beyond traditional domains.
- Dissemination of impactful research, and attraction of talented researchers from Third Countries to Europe.
- Influencing future research, enhancing predictive capabilities, and embedding machine learning solutions in SMEs' engineering practices.
- Enhancement of accessibility and transparency in research outputs.
- Broadening research portfolios, establishing joint ventures, acquiring practical machine learning knowledge, and training talented young researchers.