GRID

Newsletter Q1 2025

Welcome to the GRID newsletter!

Dear Colleagues and Partners,

Welcome to the inaugural edition of the GRID Project Newsletter! As the project coordinator, I am thrilled to share the latest updates and milestones we have achieved together. This newsletter aims to keep you informed about our **progress**, upcoming **events** and key developments.

In this edition, you will find **updates** on the successful **start of our secondments** and the **initial results** from our collaboration. We are also excited to announce GRID's official presence on the **CORDIS platform**, enhancing our visibility and outreach. Additionally, we highlight the recent **kick-off meeting**.

GRID Kick-Off Meeting at BOKU Faculty Club (14.11.24)

Project overview for newcomers

The resilience of **geoinfrastructure** is increasingly threatened by **climate change**, with EU damages currently at €0.8 billion annually, projected to rise by 1500% by the century's end. This necessitates significant investments and advancements in geotechnical engineering to fortify critical infrastructures.

Our GRID initiative aims to **integrate physics and machine learning** (ML) to address the challenges of uncertainty, heterogeneity and nonlinearity in geotechnical engineering. By leveraging **data-driven technologies** and **custom ML solutions**, we strive to revolutionize geotechnical methodologies, enhance infrastructure resilience and support climate goals.

GRID chronicles

Secondments on the starting block

The first secondment was completed with **Prof. Wu**'s stay at Hong Kong Polytechnic University from 30.11.2024 to 10.12.2024.

Prof. Wu portrayed in front of the iconic building of Hong Kong Polytechnic University during his secondment

First research achievements in the bag

Our project **community repository on Zenodo** is live, with the **first published datasets ([1],[2],[3],[4],[5],[6])**. Thanks to Ingeborg Gjerde and Zhongqiang Liu (NGI) outstanding effort, we have completed and submitted our **first deliverable** (Repository of benchmark monitoring and testing data sets) and our initial **research papers** have been submitted to the

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ISGSR conference in Oslo to be attended by many GRID researchers and to the Data in Brief journal.

A new partner on the GRID…

We have made significant progress since the project's inception. The **kick-off meeting** at BOKU University set a strong foundation for our future work. The GRID project is now officially available on the **CORDIS platform**, enhancing our visibility and outreach. We have drafted the **consortium agreement** and amended the grant agreement to **include HDAnalytics**, bringing valuable expertise in Explainable AI.

The team at HDAnalytics officially joined the GRID project on 09.12.24 after signing an amendment to the Grant Agreement

…and a new manager on the field

Field Manager is a cloud-based platform that streamlines geotechnical ground **survey data management**, supporting the entire data lifecycle from collection to quality assurance. It enhances collaboration and efficiency by allowing real-time data access and updates, whether in the field or the office. Dr. Ingeborg Gjerde from NGI praised its impact on project planning and execution.

The platform enables detailed **borehole planning**, continuous project monitoring, and seamless data sharing among stakeholders. Its modular cloud architecture ensures **scalability, performance and security**. Field Manager not only boosts project efficiency but also supports resilient infrastructure development.

Screenshot of the Field Manager software, an open and cloud-based platform for geotechnical ground survey data

Read more

Some exciting events ahead

Unleash your inner data scientist

We are currently organising a **data science competition** as part of the outreach activities. Participants will use a GRID dataset to **train a ML model** and will describe the making in a short report. The competition aims to engage young researchers and students, motivating them towards machine learning. The **prize ceremony** is tentatively planned to be held at the ICITG26 in Graz (co-organised by NGI).

Showcase your research

The following conferences (in chronological order) can be potential events to showcase GRID's results:

- **EGU25** General Assembly in Vienna (and online), 27 April–2 May 2025 (several sessions rely on methods such as ML and data science). EGU attendance can occur during **staff secondment to BOKU**. Make use of this opportunity
- **ISGSR2025** symposium in Oslo, 25–28 August (registration is open). As previously noted by the GRID WP leader and TC309 chair - Zhongqiang Liu (NGI) –

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several GRID researchers will present their work at the symposium. The GRID coordinator will also co-moderate the **6th Machine Learning in Geotechnics Dialogue**

- **IPW2025** workshop in Rostock, Germany, 10–12. September 2025. Although mainly a structural engineering workshop, it addresses the topic "Artificial Intelligence for simulation, analytics and decision support" as well as a "Plenary Lecture – Specific topic on Machine Learning" (abstract submission deadline: 7 February 2025)
- **3FOMLIG** workshop in Florence, 15–17 October (abstract submission start: 31 January 2025, deadline: 31 March 2025)
- **ICSMGE2026** conference in Vienna, 14 – 16 June 2026. The **TC309 session** Machine Learning and Big Data will be organised within the "big" ISSMGE conference.

Screenshot from the ISGSR website. The symposium will be attended by many GRID researchers

Deliverable alert!

D1.2 Guideline for integration of ML in geotechnical engineering with NGI as lead beneficiary is due by the end of March 2025. It will outline a guideline for the application and integration of ML in geotechnical engineering projects.

Mark your calendars

The **first GRID general assembly** and **WP leaders group meeting** will be held online in May 2025. The meeting date will be pooled soon. Attendance is reserved to project members, but selected outcomes can be published.

Hot off the press

Some data sets have been published within WP1 on benchmarking geotechnical datasets, sensors and field studies:

[1] Cudmani, R., Yan, W. & Wang, Z. (2025) Dataset for "Time-dependent behaviour of sand with different fine contents under oedometric loading. Zenodo. 10.5281/zenodo.14763388

[2] Foria, F. (2025) ETS Tunnel Images set from ARCHITA (example for 30m stretch acquisition format). Zenodo. 10.3030/101182689

[3] Hansen, T. F. (2024) Measure While Drilling (MWD) dataset with rock type labels for 15 Norwegian hard rock tunnels. Zenodo. 10.5281/zenodo.10358374

[4] Soranzo, E. (2025) Close range images of soils and their particle size distributions. Zenodo. 10.5281/zenodo.14725633

[5] Soranzo, E. (2024) Data underpinning the manuscript "Comprehensive Dataset of Dynamic Probing Heavy Test Results for Subsurface Characterization". Zenodo. 10.5281/zenodo.14281409

[6] Soranzo, E. (2024) Dataset for "Machine learning predictions on an extensive geotechnical dataset of laboratory tests in Austria". Zenodo. 10.5281/zenodo.14251191

Other GRID data sets referenced in deliverable 1.1 include:

[7] GGU Software (2025) GGU-CONNECT: Datenbankanwendung zur Verwaltung geotechnischer Fachdaten nach der BIM-Methode. Available at: link

[8] Hansen, T.F. (2023) Measure While Drilling (MWD) dataset with rock type labels for 15 Norwegian hard rock tunnels. Zenodo. 10.5281/zenodo.10358374

[9] NGI. (2025) Field Manager. Available at: link.

[10] Oberhollenzer, S., Premstaller, M., Marte, R., Tschuchnigg, F., Erharter, G.H. and Marcher, T. (2021) Cone penetration test dataset Premstaller Geotechnik. Data in Brief, 34, 106618. ISSN 2352-3409. Available at: 10.1016/j.dib.2020.106618

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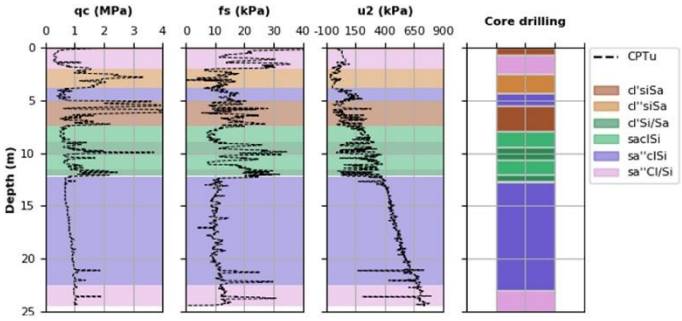

CPT and core drillings in the data set of Oberhollenzer et al. [10]. The drillings had a maximum distance of about 50 m to the tests.

Get involved

Feel free to join us at the events listed above and take part to our data science competition. We look forward to your contributions to advancing data science and geotechnical engineering.

Contact information

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https://zenodo.org/communities/grid
https://cordis.europa.eu/project/id/101182689
www.youtube.com/@GRID-Proj

Wrapping up

We would like to extend our **heartfelt thanks** to all our partners for their dedication and contributions to the project. We encourage you to **stay engaged** with our community by following our updates, participating in our events and contributing to our initiatives. Your involvement is crucial!

Group photo taken during the GRID Kick-Off Meeting. Top row, from the left: Zili Li (UCC), Christoph Mühlmann (HDAnalytics), Christopher Rieser (HDAnalytics), Ferdinando Marinelli (UNINA), Simon Buß (GGU), Zhongqiang Liu (NGI), Xiaohui Chen (UL). Bottom row, from the left: Enrico Soranzo (BOKU), Wei Wu (BOKU), Francisco Zabala (UNSJ), Emilio Bilotta (UNINA)

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