Research highlights

Geotechnical Engineering Group, Kyoto University, Japan

Kyoto University was founded in 1897, the second university to be established in Japan. As of 2019, Kyoto University has ten Faculties, eighteen Graduate Schools, thirteen Research Institutes, which is the largest among Japanese Universities. A total of 10 Nobel Prizes have been awarded to both alumni and professors of Kyoto University.

The research group in Geotechnical Engineering consists of seven laboratories in the Graduate School of Engineering, the Graduate School of Agriculture, the Graduate School of Global Environmental Studies (GSGES) and the Disaster Prevention Research Institute (DPRI). The research activities of the group cover a wide range of areas in geotechnical engineering.

Geomechanics, Graduate School of Engineering
Makoto KIMURA [Prof.], Sayuri KIMOTO [Assoc. Prof.], Ryunosuke KIDO [Asst. Prof.]

Construction Engineering and Management, Graduate School of Engineering
Hiroyasu OHTSU [Prof.], Thirapong PIPATPONGSA [Assoc. Prof.], Takafumi KITAOKA [Asst. Prof.]

Geofront System Engineering, Graduate School of Engineering
Mamoru MIMURA [Prof.], Yosuke HIGO [Assoc. Prof.], Mai SAWADA [Asst. Prof.]

Urban Management Systems, Graduate School of Engineering
Kiyoshi KISHIDA [Prof.], Yasuo SAWAMURA [Assoc. Prof.], Yusuke MIYAZAKI [Asst. Prof.]
Research Areas
Research areas include soil and rock mechanics, soil structures, foundations, soft ground, tunneling, monitoring, construction management, agricultural facilities, environmental engineering, energy and geo hazards. Current projects focus primarily on the following topics.

Soil and Rock Mechanics from Micro to Macro

1. Three-phase microstructural changes in partially saturated sand (R. KIDO and Y. HIGO)
Earth structures such as road and railway embankments exist under partially saturated state; pore spaces between grains are filled with water and air. The strength and stiffness of partially saturated soil are enhanced by suction; however, it exhibits brittle mode of failure with clear shear band due to loss of suction caused by water infiltration or shearing. Macroscopic behaviors of partially saturated soil strongly depend on microscopic three-phase interactions. It is important, therefore, to clarify the failure mechanism of partially saturated soil from a microscopic viewpoint. Our research team has investigated the failure mechanism of partially saturated soil by conducting triaxial compression tests using x-ray micro tomography (Fig. 1) (Kido et al. 2020, Kido and Higo 2019, Higo et al. 2018, Higo et al. 2013, Higo et al. 2011).

Figure 1. Visualization of three-phase microstructures and water meniscus between soil particles
2. Large deformation analysis using Material Point Method (Y. HIGO)

Recently, particle methods and mesh-free methods have been widely used for simulating extremely large deformation problems in geotechnical engineering. Material Point Method, which is a particle method originally developed for single-phase solid mechanics, has been extended to a multi-phase coupling analysis method considering effect of partial saturation and elasto-plastic constitutive relations. The extended method has been applied to slope failure of embankments subjected to infiltration of water and liquefaction-induced large deformation of river levees (Fig. 2) (Kiriyama et al. 2018, Higo et al. 2010).

![Figure 2. a) Liquefaction-induced deformation: FEM (upper) vs. MPM (lower); b) Slope failure caused by infiltration](image)

3. Mechanical and hydro-mechanical behaviors of fractured rock masses (K. KISHIDA)

When discussing the construction and the maintenance of tunnels and underground caverns and the slope stability, the mechanical and hydro-mechanical behaviors of fractured rock masses should be clarified. The mechanical and hydro mechanical behaviors of fractured rock masses are strongly affected by those of the rock joints and/or fractures. Through experimental works on single joints and/or fractures, the mechanical and hydro-mechanical behaviors of single joints are studied (Kikumoto et al. 2017).

![Figure 3. Analysis on discontinuous rock by microfocus X-ray CT](image)

---

### Soil - structure interaction

**1. Study on interaction between soil and structure (arch culvert, piles) (Y. SAWAMURA, K. KISHIDA and M. KIMURA)**

Precast arch culverts (Fig. 4), superior in appearance and labor-saving, have been encouraged to use for the purpose of the promotion of the productivity improvement in earthwork in Japan. Its seismic performance is, however, a significant issue in Japan where earthquake occurs frequently. Our research team has investigated the seismic performance of the precast arch culvert in culvert horizontal and longitudinal direction using dynamic centrifuge tests and numerical simulations (e.g., Sawamura et al. 2015). Based on the current design method, pile foundations built in soft ground or liquefiable ground have a large substructure, resulted in increasing construction cost. Therefore, the number of piles and footing can be reduced by improving soil around piles (Fig. 5). The influence of the difference in ground improvement parameters such as strength and range on the behavior of the group pile foundation has been investigated by conducting centrifuge model tests and numerical simulations (e.g., Isobe et al. 2014).
Research highlights
Geotechnical Engineering Group, Kyoto University, Japan (Con’t)

2. Design, construction, and maintenance of underground structures (K. KISHIDA and M. KIMURA)
The effective design, safety construction, and smart maintenance of geo-infrastructures and rock infrastructures are studied here. For examples, when shallow overburden tunnel is to be excavated in an urban area, the auxiliary method that will be applied should be considered. When an area is to be excavated in deep underground, seepage and the huge earth pressure that will be encountered should be considered (Cui et al. 2017).

Figure 6. Excavation analysis on vertical shaft
Figure 7. Pre-improving ground for shallow overburden tunnel

3. Clarification of seismic performance of reinforced earth wall (Y. SAWAMURA and M. KIMURA)
The steel-strip reinforced earth wall (SSREW) was developed in France in mid-1960 and currently has been used widespread all over the world. Although SSREW is well recognized as having high seismic resistance structure, mechanical role of the reinforcing material laid in the active failure zone and the mechanical role of the reinforcing material against the integrity of the SSREW have not been sufficiently verified. Through dynamic centrifuge tests and the numerical analyses, these unknown seismic behaviors due to dynamic soil structure interaction are being investigated (Sawamura et al. 2019).
4. Conservation and restoration of tumulus mounds (M. SAWADA and M. MIMURA)
Geotechnical aspects of conservation and restoration of tumulus mounds, known as the oldest earth structures, have been studied. For controlling damages due to natural hazards and man-caused destruction and passing the tumulus mounds to future generations, controlling of the stability and infiltration of the mounds and hydrothermal environment in chambers have been studied based on geotechnical experiments and numerical analyses (Sawada et al. 2015, Sawada et al. 2017, Sawada et al. 2018).

5. Theoretical analysis of earth pressure distribution (T. PIPATPONGSA, T. KITAOKA and H. OHTSU)
Load transmission in a translational retaining wall (Khosravi et al. 2016) and conical sand heaps (Nguyen et al. 2018) are thoroughly investigated by both theoretical and experimental approaches. Achievements of these researches reveal new theoretical solutions for describing earth pressure distribution which cannot be clearly derived in the past decades.
6. Numerical and physical models of undercut slope (T. PIPATPONGSA)

In order to clearly observe pre-failure mode, failure-triggering mode and post-failure mode, physical model (Khosravi et al. 2016) with various techniques of measurement and numerical models (Ukritchon et al. 2019) using 3D finite element analysis have been developed for slope stability problems. The immediate outcome of this research is a novel design method of undercut slopes in an open-pit mine.

Figure 10. a) Theoretical prediction for the distributions of horizontal active stress compared with laboratory-scale measurements; b) Trajectory of principal stresses in conical sand heap under active and passive conditions.

Figure 11. a) Arch-formed failure observed in the final step of an in-flight excavation centrifuge model; b) Incremental deviatoric strain of FEM model with 9 shear pins making a reverse triangle.

Energy Geotechnics

1. Mechanical behavior of gas hydrate-bearing soils and its numerical modelling (S. KIMOTO)

In March 2013, the world’s first offshore gas production from marine methane hydrate (MH) deposits was conducted in Eastern Nankai Trough off the Pacific coast of Japan. There still exists a lot of uncertainties regarding the mechanical behavior during methane gas production. CO₂ hydrates have been also attracting attention from the viewpoint of CO₂ storage (CCS). To investigate the mechanical behavior of hydrate-bearing sediments, compression and creep tests have been conducted synthetic CO₂-hydrate-bearing sand specimens using low-temperature and high-pressure triaxial apparatus (Fig. 12 a), Iwai et al. 2019. In addition to the laboratory tests, a chemo-thermo-mechanically coupled numerical analysis methods have been developed in order to reproduce the dynamic behavior during earthquakes and sand production (Fig. 12 b), Akaki and Kimoto 2019.
When considering the geological isolation of high-level radioactive waste and CO2 geological storage, the integration of various types of information through geomechanics, rock mechanics, fluid mechanics, thermal dynamics, and geochemistry is required. The mechanical and hydro-mechanical properties of jointed rock masses are clarified through an advanced approach and fundamental experiments with iPSSAC (interface for Pressure Solution Analysis under Coupled Conditions) coupling the thermal (T), hydro-mechanical (H), mechanical (M), and chemical (C) properties is developed (Ogata et al. 2018).

In this study, fine particle distribution in artificial slopes comprising weathered granite, which may affect rainfall-triggered landslide, was investigated comprehensively, based on electrical resistivity, soil composition and unsaturated soil properties. The results showed that while degree of saturation plays a key factor on electrical resistivity in unsaturated soil, it has close correlation to pore-size distribution. Therefore, it can be considered that electrical prospecting is an effective method to investigate distribution of both coarse particle and fine particle. In addition, it was also pointed out that there is possibility that fine particle fraction involved in soil poorly compacted in artificial slopes may be eroded due to rainfall infiltration (Ohtsu et al. 2018).
2. Applicability of neural network in rock classification of mountain tunnel (H. OHTSU and T. KITAOKA)

In construction projects of mountain tunnels, with a purpose of improving accuracies of rock classifications in preliminary survey, we have studied applicability of Artificial Neural Network (ANN). One characteristics of ANN is that it does not require defining clear formula correlating data input and output, by using its learning function. Leveraging the characteristics and accuracy of rock classification were improved by using geophysical datasets (seismic velocity and resistivity) at a tunnel face and surroundings. Also, ANN has a problem of reduced applicability caused by over learning to training data. It is possible to avoid the over learning problem by increasing training dataset, but it is not easy to accumulate complete dataset of geophysical properties and actual rock classification obtained in construction stage. We found that it is important to collect various tunnel data without much deviation, for accumulating training datasets effectively in the future (Ohtsu et al. 2018).

![Figure 15](image1.png)

**Figure 15.** a) Field monitoring survey lines in Chiang Mai site; b) Difference on electric resistivity between dry season and rainy seasons.

3. 3D modeling of grounds using in-situ investigation and geo-informatics database (M. MIMURA and Y. HIGO)

Professor Mamoru Mimura deals with various kinds of geotechnical issues including long-term settlement of reclaimed land, development of in-situ investigation technique, development and utilization of geo-informatics database, and preservation of historical structures. A recent research topic concerns 3D modeling of grounds using in-situ investigation and geo-informatics database, and its application to disaster mitigation such as seepage failure of river levees and seismic ground motion (Ichimura et al. 2019, Kudoh et al. 2019).
Agricultural Facilities Engineering

The research group of Agricultural Facilities Engineering is belonging to the department of agriculture, and working on advanced management of structures for agricultural purposes, such as embankment dams. The detailed research topics are categorized into inverse analysis and health monitoring of irrigation structures based on Bayesian inference, deformation and dynamic response of soil and concrete structures, microscopic numerical simulation of solid-fluid interaction, modeling of soil erosion, and plant-soil interaction.

1. Imaging of embankment interior (K. FUJISAWA and A. MURAKAMI)
Techniques imaging inside of soil structures or the ground such as geophysical exploration play an important role in health monitoring. The research group has developed a probabilistic inversion method which enables the stiffness (elastic modulus) of such structures to be estimated though the elastic wave propagation. Fig. 18 shows a typical result of identified spatial distribution of elastic modulus in a reconstructed embankment consisting two layers (Michael et al. 2019).

2. Modeling of soil erosion (K. FUJISAWA and A. MURAKAMI)
Erosion of soils is a complex phenomenon related to hydraulics and soil mechanics. Fig. 19 a) describes the concept that divides the phenomenon into individual motion of soil particles and continuum deformation. Hydraulic approaches are helpful for the individual particle motion, and continuum soil mechanics can be applicable to the deformation of soil surface. Fig. 19 b) shows an experimental apparatus for capturing the incipient motion of sand particles subjected to surface and seepage flows. The experimental investigation of soil erosion subjected to seepage flow are ongoing as well as constitutive modeling of soil surface (Jewel et al. 2019).
Research highlights
Geotechnical Engineering Group, Kyoto University, Japan (Con’t)

Geoenvironmental Engineering

1. Anthropogenic and geogenic contamination: characterization, utilization, and remediation (T. KATSUMI and A. TAKAI)
When selecting adequate techniques to solve problems of anthropogenic and geogenic contamination of soil and/or groundwater, the mobility of the contaminants, their mechanisms, and the reliability of the countermeasures should be scientifically clarified. We are experimentally and analytically studying the mobility of heavy metals with an emphasis on geogenic contamination (Katsumi 2015). The effectiveness of countermeasures such as vertical cutoff walls (Takai et al. 2019) and attenuation layer (Gathuka et al. 2019) (Fig. 20) are also evaluated by laboratory and field tests. These research activities directly contribute to establishing legal frameworks, such as Soil Contamination Countermeasures Act, for sustainable ground remediation and utilization in Japan. In addition, in recognition of his scientific and practical contribution, Dr. Takai won the ISSMGE Outstanding Young Geotechnical Engineer Award in 2017.

2. Geotechnical utilization of by-products and wastes (A. TAKAI and T. KATSUMI)
The social and economic system is now shifting to attain the SDGs by promoting further resource recycling and the maintenance of existing infrastructures. In this laboratory, the application of recycled wastes as geomaterials is studied from the mechanical and geoenvironmental viewpoints (Fig. 21). In addition, in order to contribute to adequate management of disaster waste generated through huge catastrophes, recovery of soils from disaster waste as geomaterial, development of disaster waste management system using ICT, and secure disposal of soils and wastes containing nuclides are also being studied (Katsumi et al. 2017).
Research highlights
Geotechnical Engineering Group, Kyoto University, Japan (Con’t)

3. Sustainable waste treatment and management (A. TAKAI and T. KATSUMI)
Even with the upmost effort to reduce waste generation in our daily lives, a certain amount of waste is going to be generated into the future, unfortunately. This laboratory is performing a series of research related to the hydraulic performance of geosynthetic clay liners (GCLs) (Naka et al. 2019) (Fig. 22 a)), the mobility assessment of toxic elements in the sites, the mechanical properties of waste ground (Nguyen et al. 2015), and the risk assessment of the utilization of closed landfill sites (Fig. 22 b)).

Geotechnics for Geo Hazard Mitigation

Main research interests are combined disasters induced by rainfall, earthquake and tsunami etc. To better understand the complex behavior of soil-structure systems under various external forces, Prof. Uzuoka and Asst. prof. Ueda have been engaged in the advancement of constitutive modeling of geomaterials including partially saturated soils, and the development of innovative centrifuge modeling. A recent research topic concerns the reliability improvement of numerical simulations based on Uncertainty Quantification (UQ) with Verification and Validation (V&V) method.

1. Seismic behavior of partially saturated ground (R. UZUOKA and K. UEDA)
The role of pore air pressure on the seismic behavior of partially saturated soils is investigated through recent numerical simulations with three-phase and simplified two-phase coupled analyses (Uzuoka et al. 2019). Constitutive modeling of partially saturated soils has been developed, along with governing equations for the dynamic behavior of such soils based on porous media theory. This research focuses on the validity of three-phase coupled analysis and the applicability of simplified two-phase coupled analysis through simulations of cyclic triaxial tests and seismic behaviors of horizontal ground and embankments.
2. Seismic behavior of inherently anisotropic ground (K. UEDA)
Inherent anisotropy is a crucial aspect to consider for an improved understanding of the strength and deformation characteristics of granular materials. Its influence on ground seismic responses was examined through a series of dynamic centrifuge model tests on liquefiable level sand deposits (Ueda et al. 2019). During the model setup, different deposition angles (between 0 and 90 degrees) were achieved using a specially designed rigid container. The dynamic responses under tapered sinusoidal waves demonstrate that a sandy ground, deposited at a higher angle (i.e., closer to 90 degrees), is more susceptible to liquefaction.

3. Generalized scaling law for centrifuge modeling (K. UEDA)
The generalized scaling law is based on the concept of two-stage scaling and allows currently available centrifuge facilities to model a large-scale prototype subject to earthquake motions. Its application to the fully nonlinear regime of a soil-structure system, i.e., a pile model embedded in an inclined ground subject to liquefaction-induced lateral spreading, was investigated (Ueda et al. 2019). The seismic responses demonstrate that the generalized scaling law is applicable to the fully nonlinear regime of soil-structure systems subject to the cumulative shear strain in the order of 10% due to cyclic mobility of sands during earthquakes.

4. Liquefaction Experiments and Analysis Projects (LEAP) (K. UEDA and R. UZUOKA)
The Liquefaction Experiments and Analysis Project (LEAP) is a joint international project that pursues the verification, validation and uncertainty quantification of numerical liquefaction models. As part of LEAP-GWU-2015, LEAP-UCD-2017, and LEAP-ASIA-2019 campaigns, a series of centrifuge model tests and numerical simulations have been developed at the Disaster Prevention Research Institute, Kyoto University to simulate the dynamic behavior of a submerged sloping sandy deposit (Ueda et al. 2019, Vargas et al. 2019). The results are intended to compose part of a reliable database in the development of current and future V&V processes of liquefaction models.
The Corporate Associates Presidential Group (CAPG) is a Board level committee to develop actions and activities to enhance the commercial section of the ISSMGE. It provides a home and a voice within the ISSMGE for the commercial section of the international geotechnical community.

A question was raised “Are we overdesigning?” in XVI Danube European Conference (Skopje Macedonia, June 2018). Thus, CAPG, together with Young Members Presidential Group (YMPG), Technical Committees TC205, and TC304, launched a global survey to assess the consistency of calculation models and design methods for a variety of geotechnical structures, and where possible, to compare the results with full-scale tests and reliability analyses (this survey is open till Dec 2020, please refer to https://www.issmge.org/news/are-we-overdesigning-a-survey-of-international-practice). The CAPG also intends to create platforms to discuss, debate, and promote issues relating to geotechnical engineering, that are perceived to have a significant impact on the commercial section of the ISSMGE. In the CAPG Plenary Session in 16th ARC, CAPG had a 1 hour theme session on the subject of ‘Overdesign’ and presented the initial results of the global survey.

The CAPG session was held on 15th October 2019, the second day of the Conference and was attended by a large number of over 900 participants of the conference. The format of the plenary session took the format of a panel and open floor discussion. The CAPG Chair (2013 - 2019), Sukumar Pathmanandavel opened the session, and the Vice President of the Asia Region of ISSMGE, Professor Eun Chul Shin introduced ISSMGE and CAPG.

We had five panelists from different parts of Asia, including Professor Paulus P. Rahardjo from Indonesia, Mr. Ravi Sundaram from India, Professor Za-Chieh Moh from Taiwan, Dr. Johnny Cheuk from Hong Kong, and Dr. Hiroyasu Ishii from Japan. They shared their views on the topic of ‘overdesign’, such as how to define ‘overdesign’, how site investigation, codes and standards, instrumentation/ monitoring, impact the design, and whether the designers tend to over- or under-design. Then, Dr. Peter Day (incoming Chair of the CAPG) discussed the interim results of the global survey.
The panel discussion generated active floor discussion. Participants from different sectors of the industry, including academia, consultants, contractor, shared their views on overdesign, and suggestions on improving the design. Besides traditional floor discussion, an app “Slido” was used to receive responses and questions from the participants. In addition, a poll on “Which area do you think will have the biggest impact on overdesign if it is improved” was held via “Slido”, and good number of responses was received.
As there were overwhelming responses in the open floor discussion, and not enough time for all the delegates who wanted to contribute, a further lunch session was held next day on 16\textsuperscript{th} October 2019 at the hall where the conference lunch was served, again with a large number of delegates present.

Some of the questions and comments being raised in the open floor discussion, lunch time session and via “Slido”:

- The concept of overdesign is a relative one, it requires a probabilistic requirement, not a deterministic answer.
- Will industry collaboration make designs more competitive?
Engineers’ liability, contractual issues, impact on society have impact on over or under-design. Hence, engineers are usually on the side of conservative, and innovation might not be encouraged.

- Education on client on project specification and requirements are important, clients may be required to share the risk in some cases to generate a more innovative design
- Observation method, with good monitoring may be adopted to modify the design from time to time. Assumptions can be wrong, when more information is obtained in the field during construction, mitigation measures may be required to rectify or better design could be adopted.

The CAPG Plenary Session in 16 ARC is only the beginning of the discussion on the topic of ‘overdesign’. We would like to continue the discussion and have your responses and comments. Please join our discussion in Geoworld: [https://www.mygeoworld.com/groups/corporate-associates-presidential-group-capg](https://www.mygeoworld.com/groups/corporate-associates-presidential-group-capg)

Also, don’t forget to participate our Global Survey on “Are We Overdesigning? - A Survey of International Practice”. More information can be found here: [https://www.issmge.org/news/are-we-overdesigning-a-survey-of-international-practice](https://www.issmge.org/news/are-we-overdesigning-a-survey-of-international-practice). The results and findings of the survey will be presented in 20th International Conference on Soil Mechanics and Geotechnical Engineering in Sydney.

*Ceres Chung*  
*Secretary of Young Member Presidential Group*
1 Introduction

Digital transformation is occurring at a rapid pace in many industries. ISSMGE has taken leadership in hastening this transformation by establishing a new TC309 in Machine Learning and Big Data. TC309 has since organized two International Symposium on Machine Learning and Big Data in Geoscience (Norwegian Geotechnical Institute, Oslo, Norway, October 21 - 22, 2018; Tongji University, Shanghai, China, July 28 - 30, 2019). As a continuation of these activities, a machine learning (ML) dialogue for geotechnics was held in the National Taiwan University on 14 December, 2019, following the 7th International Symposium on Geotechnical Safety and Risk (ISGSR 2019) organized under the auspices of the Geotechnical Safety Network (GEOSNet) between December 11 and 13 2019 in Taipei. The machine learning dialogue was hosted by Prof. Jianye Ching (Chairman of ISSMGE TC304) at the Department of Civil Engineering, National Taiwan University, and was coordinated by Prof. Kok-Kwang Phoon (National Singapore University), Prof. Zi-Jun Cao (Wuhan University), and Prof. Yu Wang (City University of Hong Kong). This dialogue is supported by ISSMGE TC304, TC309 and TC210. Thirty-five experts from 13 countries and regions were invited to attend the dialogue (see a group photo in Figure 1).

The aim of the ML dialogue is to discuss the opportunities and challenges in developing and applying ML to geotechnical engineering research and practice. The focus is to discuss big ideas that can transform research and practice in completely new ways. Coordinators prepared reading materials to provide background information on ML and their current nascent applications in geotechnical engineering and pose key questions and desired outcomes to stimulate and structure the discussion. The reading materials, including a 2020 Georisk Spotlight paper on “The story of statistics in geotechnical engineering” (Phoon, 2020) were circulated to the participants 3 weeks before the dialogue. The participants were expected to actively engage in small group discussions during the dialogue. The organization and discussion rules of the ML dialogue were detailed in the proceedings of ISGSR 2019 (Phoon et al., 2019). The article summarizes the proceedings (including opening ceremony and presentation, group discussion, and all-group discussion) and key conclusions of the ML dialogue.

Figure 1. Participants of the machine learning dialogue at the Department of Civil Engineering, National Taiwan University, 14 December 2019
2 Opening Ceremony and Presentation

At the opening ceremony, Prof. Jianye Ching warmly welcomed all the participants of the dialogue, and Dr. Zhongqiang Liu (Chairman of ISSMGE TC309, Norwegian Geotechnical Institute) reported outcomes from the pre-workshop panel discussion session that took place in the 2nd International Workshop on Machine Learning and Big Data in Geoscience organized by ISSMGE TC309 in Shanghai, July 28-30, 2019. Following the opening ceremony, Prof. Kok-Kwang Phoon gave a presentation to explain the purpose of the ML dialogue in the context of digital transformation. He called the digital transformation of geotechnical engineering as GEO 4.0 and highlighted that the new wicked problems (e.g., resilience and sustainability of both new and aging infrastructure) can only be solved by deploying digital technologies in the spirit of GEO 4.0. Prof. Kok-Kwang Phoon also proposed 7 “E”s in the GEO 4.0 research agenda covering Essence (core asset is data), Economic value (value of data to industry), Exchange (data sharing), Extremes (dealing with outliers), Errors (dealing with uncertainties), Extrapolation (dealing with overfitting), and Explanation (white box ML). Prof. Kok-Kwang Phoon concluded with three desired outcomes for the ML dialogue:

• What are the research questions? (be as specific as possible)
• What is our wish list? (“blue sky” ideas)
• What does TC304/TC309 need to do to lead the GEO 4.0 agenda?
3 Group Discussion

Following the open ceremony, participants were divided into 5 small groups (see Table 1), with about 7 persons (including one facilitator and one reporter) in each group for individual group discussion. The identified facilitators guided their group discussions to achieve at least one desired outcomes. Each facilitator/reporter presented key ideas arising from the group discussion. The presentation was limited to two minutes.

Table 1. Organization of group discussion

<table>
<thead>
<tr>
<th>Group ID</th>
<th>Facilitator</th>
<th>Reporter</th>
<th>Group members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I</td>
<td>Kok-Kwang Phoon</td>
<td>Jinhui Li</td>
<td>Jianye Ching, Wuzhang Luo, Wojciech Pula, Johan Spross, Xiaohui Tan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adeyemi Aladejare, Michele Calvello, Lulu Zhang, Bram Van Den Eijnden,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Changhong Wang</td>
</tr>
<tr>
<td>Group II</td>
<td>Yu Wang</td>
<td>Wenping Gong</td>
<td>Adeyemi Aladejare, Michele Calvello, Lulu Zhang, Bram Van Den Eijnden,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Changhong Wang</td>
</tr>
<tr>
<td>Group III</td>
<td>Zhongqiang Liu</td>
<td>Dongming Zhang</td>
<td>Tom Charlton, Jinsong Huang, Jonathan Nuttall, Zhiyong Yang, Tengyuan Zhao</td>
</tr>
<tr>
<td>Group IV</td>
<td>Iason Papaioannou</td>
<td>Ivan Depina</td>
<td>Jing-Sen Cai, Zi-Jun Cao, Michael Hicks, Thi Minh Hue Le, Limin Zhang</td>
</tr>
<tr>
<td>Group V</td>
<td>Ikumasa Yoshida</td>
<td>Takayuki Shuku</td>
<td>Shinichi Akutagawa, Richard Bathurst, Hyun-Ki Kim, Andy Yat Fai Leung,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yu Otake, Te Xiao</td>
</tr>
</tbody>
</table>

The discussion in Group I (see Figure 3) started with sharing experiences on ML-related projects. During the discussion, three aspects were addressed, including data sharing, accessibility of national databases, and the value of a real flagship project for future discussions. Group I proposed a “data sandbox” that involves multiple industry players and researchers to “play” in the sandbox in terms of developing data-driven algorithms of significant value to industry while maintaining data confidentiality and respecting intellectual property rights. It is proposed that the researchers engage a single industry player to work on a win-win agreement to create a legally safe space for data sharing.

The discussion in Group II (see Figure 4) started with data. It was emphasized that data in ML shall not only be limited to conventional geotechnical data, but also include non-conventional data. One key point for ML algorithms is how to use or develop geotechnical ML algorithms to obtain valuable geotechnical information from these non-conventional data for decision making in engineering practice. Another important point raised during the discussion is the value-add or benefit from using ML to geotechnical engineering practice. It was pointed out that industry partnership is the key and concrete and high-profile successful examples of ML applications are urgently needed.
The discussion in Group III (see Figure 5) mainly focused on practice related issues for ML research. Three major aspects were discussed, including application fields, circumstances for the use of ML, and ML methods. Value of engineering judgement was highlighted. It was pointed out that ML methods can be used with knowledge from multiple disciplines. The importance of physics-based domain knowledge was emphasized by adding physical constraints in data analysis and/or developing hybrid models considering both physics and data. The role of ML methods was considered to be supplementary to physics-based modeling.

The discussion in Group IV (see Figure 6) started with a review of different ML methods and their classifications (e.g., supervised and unsupervised methods). Thereafter, each group member discussed the types of ML that they have applied in geotechnical engineering problems. Then, the group discussion focused on identifying a number of challenges in the further application and promotion of ML in geotechnical engineering, such as those in data sharing, enhancement of the predictability of ML approaches through infusing the physics of the problem, etc. The importance of education of potential users, e.g., through short courses addressed to the industry, was also highlighted.
The discussion in the Group V (see Figure 7) centered on “Our Wish List”. The wish list achieved in the discussion included database on infrequent geotechnical events (e.g., slope failure), access to large amount of data, more investment in site investigation in construction projects, open web database, user-friendly supercomputer and quantum computer, better collaboration between industry and academics to design monitoring programs for instrumented structures and analysis of data, a new journal devoted to ML in geotechnical engineering, collaboration with other ISSMGE TCs, reducing fatalities/injuries from geotechnical failures by using monitoring, fast data processing and ML.

Figure 7. Discussion by Group V

4 All-Group Discussion

The all-group discussion session was open to all participants to express their views and reactions. The discussions covered how to demonstrate value of data in geotechnical designs, possible venues for publication of ML-related geotechnical studies, how to incorporate physics-based domain knowledge into geotechnical data analytics, and the ML wish list. Finally, Prof. Kok-Kwang Phoon summarized the discussions and closed the dialogue with following concluding points:

- Industry is a necessary partner for ML-based studies in geotechnical engineering. There are two compelling reasons. One, ML must bring transformative value to industry, not universities. This value is ultimately linked to the end users that the industry serves. Two, real data are generated and owned by projects and they are necessary ingredients for ML development (not simulated data).
- A “data sandbox” is needed to enable and accelerate data sharing between industry and research. Theoretical and pure methodology development of ML is not seen to be the immediate priority.
- Future discussions on this topic, including organization of future workshops, should be tied to a specific flagship project with the industry. This “AlphaGeo” project (cf. Google’s “AlphaGo” project) is ideally game changing, rather than improving some aspects of existing practice in an incremental way.
Acknowledgements

The dialogue was supported by ISSMGE TC304 (Chair, Prof Jianye Ching), TC309 (Chair, Dr Zhongqiang Liu), and TC210 (Chair, Prof Limin Zhang). It could not be held successfully without the enthusiastic participation and contributions from all the invited experts (refer to Table 1). The coordinators would like to thank Prof. Jianye Ching for hosting the dialogue at the National Taiwan University and all facilitators and reporters for their efforts in coordinating the preparation for the dialogue and guiding group discussions. Special thanks go to Prof. Jinhui Li (Harbin Institute of Technology, Shenzhen), Prof. Yu Wang (City University of Hong Kong), Prof. Dongming Zhang (Tongji University), Dr. Iason Papaioannou (Technical University of Munich), and Dr. Takayuki Shuku (Okayama University) for contributing a summary of their group discussions to this article. The assistance provided by Mr. Qin-Xuan Deng (PhD Candidate, Wuhan University) in preparing for this ML dialogue, including taking the photographs included in this article, is gratefully acknowledged.

References

GeoSt.John’s 2019, the Canadian Geotechnical Society’s 72nd annual conference, was held September 29 - October 2, 2019 in St.John’s, Newfoundland and Labrador. The conference theme was Under Land and Sea; because of the growth of the offshore oil and gas industry in Atlantic Canada has created many opportunities for the geotechnical community, the conference program highlighted recent achievements in offshore and nearshore geotechnical engineering. Over 500 delegates were in attendance, with over 230 technical papers presented, and many great opportunities for networking and connecting during the three days. The trade show held 45 suppliers, contractors, and consultants; 22 companies sponsored the conference in various ways, including two top-level (Diamond) sponsors: Clifton Associates and Klohn Crippen Berger. This year’s Keynote Lectures included:

- R.M. Hardy Address - Dr. Ryan Phillips, C-CORE, Centrifuge Modelling - ‘A Mari usque ad Mare’
- CGS Colloquium - Dr. Kathy Kalenchuk, RockEng, Mitigating a fatal flaw in modern geomechanics: understanding uncertainty, applying model calibration, and defying the hubris in numerical modelling

Many award winners were recognized at the CGS Awards Banquet, from young professionals and students, to engineers and geotechnical professionals well-established in their careers. During the Legget Award Luncheon, Arun Valsangkar, Professor Emeritus at the University of New Brunswick and former editor of the Canadian Geotechnical Journal, was awarded the Legget Medal - the most senior and prestigious CGS award, given for significant lifelong contribution to the geotechnical field in Canada. The CGS introduced its new Early Achievement Award, with its first recipient being Suzanne Powell of Thurber Engineering Ltd. and past CGS Vice President Technical (2017-2018). The Dennis Becker MSc. Prize was also presented for the first time, to Andrea Walsh of the Department of Civil Engineering at Queen’s University.
Andrea Walsh, Queen’s University, receiving the Dennis Becker MSc Prize. Also pictured from left to right: CGS President Mario Ruel, CGS Student Awards Administrator Dr Ryley Beddoe, Dr Dennis Becker, of the Canadian Foundation for Geotechnique and Dr Kevin Biggar, President

The 6th Canadian Young Geotechnical Engineers and Geoscientists Conference (cYEGEC) was held in St. John’s from September 26-28, just before GeoSt.John’s 2019. The cYEGEC is an event held every three years that gathers students and young professionals from across Canada and beyond. The conference focuses on providing an opportunity to young professionals and students with geotechnical and geosciences backgrounds to meet their peers, exchange technical knowledge and interact with experts in a relaxed environment.
Conference report (Con’t)

GeoSt.John’s 2019, Canada

Keynote Speakers at this year’s conference included CGS President (2019-2020), Mario Ruel; CGS Vice President Finance (2019-2020), Vice-President Engineering and CTO at TREK Geotechnical, Kent Bannister; Senior Principal, Geotechnical Engineer at Stantec, Paul Deering; Principal geotechnical engineer at BGC Engineering Inc., Pete Quinn; Professor & Head at the Department of Civil Engineering, University of Calgary, Jocelyn Hayley; and Honorary Research Professor at Memorial University, Derek Wilton.

This year’s Canadian Geotechnical Conference, GeoCalgary 2020 will be held in Calgary, Alberta from September 13-16, 2020. Visit www.geocalgary2020.ca for more details. We hope to see you in Calgary this fall!
The XVI Panamerican Conference on Soil Mechanics and Geotechnical Engineering was organized by the International Society of Soils Mechanics and Geotechnical Engineering (ISSMGE) and the Mexican Society of Geotechnical Engineering (SMIG), and was held at the Convention Centre of the Iberostar Hotel, in Cancun, Mexico between the 17th and 20th of November, 2019.

Before the conference starting day, 11 pre-conference technical lectures were conducted in different topics, as well as the networking events and welcome cocktail.

The conference began with the opening ceremony and the 9th Arthur Casagrande Lecture presented by Gabriel Auvinet Guichard, at which a case study of the geotechnical engineering application in spatially variable soft soils in Mexico City was discussed. After word, the conference proceeded with 19 technical sessions with side range of geotechnical topics, which were distributed in three sessions periods during each of the conference three days.

In the middle of the first day, Dr. Charles Ng (President of the ISSMGE) conducted his lecture on the interplay between ecology and unsaturated soils. Also, the second and third day of the conference were opened up with discussion of the history and future of partnership between the industry and academia, presented by Mary Ellen and Juan Pailun (conference co-chairs).

In the beginning of each technical session, a related keynote lecture was presented followed by around 7 to 8 technical presentations presented by professors, graduate students and professional geo-practitioners from different parts of the world.

I was proud to have the opportunity to present part of my PhD research in the morning of the second day (November 19, 2018) answer some questions and get feedback from other colleagues and senior professors. The conference was ended in Wednesday evening by the closure ceremony and gala dinner.

Finally, I would like to express my great thanks and appreciations to the ISSMGE foundation for helping me to attend this famed and high-level conference.
The 7th African Young Geotechnical Engineers Conference (AYGE) and the 17th African Regional Conference on Soil Mechanics and Geotechnical Engineering (ARC2019) were both organised and successfully hosted by the Geotechnical Division of the South African Institution of Civil Engineering under the auspices of the International Society of Soil Mechanics and Geotechnical Engineering. The AYGE started with a fun filled welcome function where young engineers had enough time to socialise prior to the conference. The one-day AYGE featured a keynote lecture by Dr. Graham Howell who was appointed the grandfather for the conference. His lecture touched on the lessons learnt from his 35 years of experience on key projects, and the importance of engineering as an integration of disciplines. About 50 technical papers were presented by young engineers from across 25 different countries which provided a good platform for young members to share research ideas together.

The ARC2019 started with welcome addresses from the Vice President for Africa, Etienne Marcelin Kana, and the President of ISSMGE Charles W.W. Ng. This was followed by the Franki Book Launch where every delegate received a complimentary copy. Four selected courses were then held namely Unsaturated Soils, Design of Column Supported Embankments, TC307 Sustainability in Geotechnical Engineering, and Barrier Systems for Limiting Fluid Migration. These lectures cover the entire day which was good as there was so much to learn from the renowned experts in the various fields.

Professor Delwyn Fredlund presented the Jennings Lecture on ‘Determination of Unsaturated Soil Property Functions for Engineering Practice. The Bright Spark lecture was delivered by Dr. Charles MacRoberts on ‘Challenge to Judgement’. This was followed by the Corporate Associates Presidential Group (CAPG) Workshop, which highlighted Innovations in Engineering Practice. Presentations were made by several Corporate Associates of ISSMGE present at the conference.

Various technical sessions were held in parallel sessions. Speakers presented their technical papers in 8 minutes followed by 2 minutes of questions and answers. Since all technical papers had been reviewed by a scientific committee from various geotechnical fields, the quality of the papers was excellent.

An elegant gala dinner was organized to climax the conference which showcased rich cultural music and dance by a Zulu dance troupe.

With Prof. Neil Taylor (ISSMGE, UK)  
With some young members at the exhibition stands

Felix Jojo Ayeh  
Kwame Nkrumah University of Science and Technology, Ghana
The 7th African Young Geotechnical Engineers Conference and the 17th African Regional Conference on Soil Mechanics and Geotechnical Engineering were organised and hosted by the South Africa Geotechnical Society under the auspices of ISSMGE. The conferences were held in Century City Hotel in Cape Town, South Africa. The African Young geotechnical engineers conference took place on 6th of October 2019 while the African Regional conference on soil mechanics and geotechnical engineering was held on the 7th to 9th of October 2019. These two conferences are the most important in Africa for geotechnical engineers. The African Young geotechnical engineering conference started on Saturday 5th October with a joyous party in a bus from 6pm to 10pm. On the 6th October, young geotechnical engineers were given the international platform to present their researches and case studies. Before the presentations, DR. Graham Howell motivated us through sharing with us his life experience (various projects he has handled and the challenges involved). I had the opportunity to present my research titled “A laboratory study on swell reduction of expansive soil treated with lime”.

The African Regional Conference on soil mechanics and geotechnical engineering started with an open declaration by Prof. Denis Kalumba (chairman of the organising committee), opening address by Solly Phalanndwa, welcome address from ISSMG president (prof Charles Ng), congratulatory address from IGS’s president (Prof Chungsik Yoo), the Chairman of the conference. The three-day conference comprised of courses, keynote, Jennings and Mercer lectures in the morning, technical and parallel sessions. Introduction of coffee breaks made it easier to interact with presenters for better understanding.

After all the joyous moments the conference was ended on the 9th of October 2019. The closing ceremony came to an end with Tunisia mentioned as the country to host the next African Regional Conference on Soil Mechanics and Geotechnical Engineering. I believe that the knowledge I have acquired from this conference will lead me to pursue my geotechnical carrier better.

I would like to use this opportunity to thank the ISSMGE foundation for their support which made it possible to participate in this most prestigious geotechnical conference.

With Prof Ampadu and Jojo from Ghana

With Timothy Bijugo of Tech Lab, Uganda

Brobbey Daniel Ackah
Kwame Nkrumah University of Science and Technology/ Admir Technologies, Ghana
The 27th European Young Geotechnical Engineers Conference was held in Bodrum, Mugla, Turkey and I had the chance to get an ISSMGE grant to attend it. I had submitted oral presentation on the results of my laboratory tests. The conference was attended by more than 50 scientists and specialists from different countries of Europe.

Each of them has already achieved a lot in its direction, has supported its assumptions with analytical calculations or grids in software complexes.

It was very interesting to hear the reports of leading professors:
- Prof. Pierre Delage, topic: The mechanical properties of Martian soils: insights from InSight.
- Dr. Nejan Huvaj, topic: Stability of natural and man-made slopes: from FS to RFEM and MPM.
- Dr. Andrea Dominijanni, topic: Chemico-osmotic effects in bentonite-based barriers for containment applications.
- Prof. İlknur Bozbey Topic: Effects of soil pulverization level on lime stabilized clays: Implications on pavement design and performance.

The coffee and lunch breaks between the sessions provided an excellent opportunity to discuss the presentations and exchange ideas with colleagues.

Fresh sea air and beautiful landscapes helped to get distracted in the evening after a long day spent in the conference hall behind the discussion of a large number of reports of young scientists from all over Europe.

Each evening ended with an interesting joint entertainment in which each person could express himself and present his country.

During the conference, I could widen my horizon in various fields of geotechnical engineering as a PhD student. I got an excellent opportunity to meet and talk to many professors, researchers and engineers from different countries and many other potential research collaborators as well.

I would like to thank ISSMGE in general and ISSMGE Foundation for the opportunity to participate in such high-level conferences and for their award.

Kupreichyk Anna
Kharkiv national university of civil engineering and architecture, Kharkiv city, Ukraine
ISSMGE EVENTS

Please refer to the specific conference website for full details and latest information.

2020

4th International Conference on Geotechnical Engineering
Location: Le Royal Hammamet Hotel, Tunisia, Hammamet, Tunisia
Organiser: Research Laboratory Geotechnical Engineering and Georisks
Date: 09-03-2020 - 11-03-2020
Contact person: Mme Haifa Guerfi. Address: ENIT, BP 37 Le Belvédère Tunis; Phone: +216.27.036.080; Fax: +216.71.872.729; Website: http://www.icge20.geolab.tn; Email: contact@geolab.tn

First International Symposium on Construction Resources for Environmentally Sustainable Technologies (CREST2020)
Location: Nishijin Plaza, Kyushu University, Fukuoka, Japan
Date: 10-03-2020 - 12-03-2020
Organiser: Kyushu University, Fukuoka, Japan;
Contact person: Dr. Siavash Manafi Khajeh Pasha, Address: West Building No. 2, Room No. 1124 744 Motooka, Nishi-ku, Phone: +81 092-802-3369, Fax: +81 092-802-3368,
Email: info@crest2020.com,
Website: https://crest2020.com/.

4th European Conference on Physical Modelling In Geotechnics
Location: Luleå Technical University, Sweden
Date: 15-03-2020 - 17-03-2020
Organiser: Luleå Technical University - Jan Laue; Contact person: Per Gunnvard; Address: LTU Laboratorievägen; Phone: +46920493582; Email: per.gunnvard@ltu.se; Website: http://www.ltu.se/ecpmg

14th Baltic Sea Geotechnical Conference 2020
Date: 25-05-2020 - 27-05-2020
Location: Clarion Hotel Helsinki, Finland
Language: English
Organiser: Finnish Geotechnical Society
Contact person: Leena Korkiala-Tanttu
Email: leena.korkiala-tanttu@aalto.fi
Email: ville.raassakka@ril.fi

18th NGM Nordic Geotechnical Meeting
Date: 25-05-2020 - 27-05-2020
Location: Helsinki, Finland
Contact person: Ville Raassakka
Email: ville.raassakka@ril.fi
Event Diary (Con’t)

1st International Conference on Embankment Dams (ICE’2020): Dam Breach Modelling and Risk Disposal
Location: Beijing International Convention Center, Beijing, China,
Date: 05-06-2020 - 07-06-2020
Language: English
Organiser: ISSMGE TC210 on Embankment Dams;
Website: http://iced-2020.host30.voosite.com/;
Email: iced2020@163.com

International Conference on Challenges and Achievements in Geotechnical Engineering
Location: POLIS University campus, Tirana, Albania;
Date: 11-06-2020 - 13-06-2020
Language: English
Organiser: Albanian Geotechnical Society
Contact person: Erdi Myftaraga
Phone: +355699336911,
Email: emy@greengeotechnics.com

XIII International Symposium on Landslides (13 ISL) - Cartagena 2020
Date: 15-06-2020 - 19-06-2020
Location: Hotel Las Américas, Cartagena, Colombia
Language: English
Organiser: Colombian Geotechnical Society
Contact person: Juan Montero Olarte
Address: Transversal 28B No. 37-47
Phone: 57 1 2694260
Email: isl2020@scg.org.co
Website: http://www.scg.org.co

International Conference on Geotechnical Engineering Education
Location: Greece, Athens
Date: 24-06-2020 - 25-06-2020
Language: English
Organiser: TC306
Contact person: Marina Pantazidou
Email: gee2020athens@gmail.com
Website: https://www.gee2020.org

4th European Conference on Unsaturated Soils - Unsaturated Horizons
Location: Instituto Superior Técnico, Lisbon, Portugal
Address: Av Rovisco Pais, 1
Date: 24-06-2020 - 26-06-2020
Language: English
Organiser: IST, TUDelft and UPC
Contact person: info@EUNSAT2020.tecnico.ulisboa.pt
Website: http://www.EUNSAT2020.tecnico.ulisboa.pt
TC204: Geotechnical Aspects of Underground Construction In Soft Ground - TC204 Cambridge 2020
Date: 29-06-2020 - 01-07-2020
Location: University of Cambridge, United Kingdom
Language: English
Organiser: University of Cambridge
Contact person: Dr Mohammed Elshafie
Address: Laing O'Rourke Centre, Department of Engineering, Cambridge University
Phone: +44(0) 1223 332780
Email: me254@cam.ac.uk

3rd International Conference on Geotechnical Engineering
Location: Cinnamon Grand, Colombo ; Sri Lanka
Date : 10-08-2020 - 11-08-2020
Language : English
Organiser : Sri Lankan Geotechnical Society ;
Contact person: Dr. JSM Fowze;
Address: 415, Baudhaloka Mawatha
Email: slgssecretariat@gmail.com;
Website: http://icgecolombo.org/2020/index.php

4th International Symposium on Frontiers in Offshore Geotechnics
Date: 16-08-2020 - 19-08-2020
Location: University of Texas, Austin, United States
Language: English
Organiser: ISFOG 2020 Organising Committee
Contact person: Phil Watson
Address: The University of Western Australia
Phone: 0418881280
Email: phillip.watson@uwa.edu.au
Website: http://www.isfog2020.org

4th International Conference on Transportation Geotechnics (4th ICTG)
Location: Sheraton Grand Chicago, USA
Date: 30-08-2020 - 02-09-2020
Organiser: Professor Erol Tutumluer, 4th ICTG Chairman and Chair of ISSMGE TC 202,
Contact Information: Professor Erol Tutumluer,
Address: 1205 Newmark CEE Laboratory, MC-250 205 N. Mathews,
Phone: +1 (217) 333-8637,
Email: CITL-ICTG2020@illinois.edu,
Website: http://www.conferences.illinois.edu/ICTG2020

6th International Conference on Geotechnical and Geophysical Site Characterization
Date: 07-09-2020 - 11-09-2020
Location: Budapest Congress Center, Hungary , Budapest
Language: English
Organizer: Hungarian Geotechnical Society
Contact person: Tamas Huszak
Address: Muegyetem rkp. 3.
Phone: 0036303239406
Email: huszak@mail.bme.hu
Website: http://www.isc6-budapest.com
Email: info@isc6-budapest.com
Event Diary (Con’t)

27th European Young Geotechnical Engineers Conference and Geogames
Location: National Research Moscow State University of Civil Engineering, Russia, Moscow
Date: 17-09-2020 - 19-09-2020
Language: English
Organiser: Russian Society for Soil Mechanics, Geotechnics and Foundation Engineering
Contact person: PhD Ivan Luzin
Address: NR MSUCE, 26 Yaroslavskoye shosse
Phone: +7-495-287-4914 (2384)
Email: youngburo@gmail.com
Additional Information: https://t.me/EYGEC2020

2nd International Conference on Energy Geotechnics
Location: Robert Paine Scripps Forum for Science, Society and the Environment. La Jolla, CA, USA.
Date: 20-09-2020 - 23-09-2020
Language: English
Organiser: John McCartney (UC San Diego, USA) and Ingrid Tomac (UC San Diego, USA)
Contact Information: ICEGT-2020 Secretariat,
Address: 9500 Gilman Dr., La Jolla CA,
Phone: +1-858-822-5212,
Fax: +1-858-822-2260,
Email: secretariat@icegt-2020.com,
Website: https://icegt-2020.eng.ucsd.edu/home

3rd International Symposium on Coupled Phenomena in Environmental Geotechnics
Location: Kyoto University, Japan
Date: 29-10-2020 - 30-10-2020
Language: English
Organiser: TC215 (Environmental Geotechnics), Japanese Geotechnical Society (JGS), and Kyoto University
Contact person: Takeshi Katsumi
Address: Yoshida-honmachi
Phone: +81-75-753-9205
Fax: +81-75-753-5116
Email: katsumi.takeshi.6v@kyoto-u.ac.jp
Website: https://icpeg2020.org
Email: cpeg2020@geotech.gee.kyoto-u.ac.jp

Geomeast 2020 International Congress and Exhibition - 08-11-2020 - 12-11-2020
Location: Cairo, Egypt
Language: English
Organiser: Soil-Structure Interaction Group in Egypt (SSIIE)
Contact person: Ms. Amany El-Masry, Address: Nasr City
Email: info@ssige.org
Website: http://www.geomeast2020.orgm
Event Diary (Con’t)

10th International Conference on Scour and Erosion
Location: DoubleTree Washington DC - Crystal City, USA,
Date: 15-11-2020 - 18-11-2020
Language: English
Organiser: Geotechnics of Soil Erosion Committee, ASCE Geo-Institute;
Contact person: Ming Xiao (ICSE-10 Chair);
Address: Pennsylvania State University;
Phone: 010-814-865-8056;
Email: mxiao@engr.psu.edu;
Website: https://www.engr.psu.edu/xiao/ICSE-10%20Call%20for%20abstract.pdf

2021

3rd Pan-American Conference on Unsaturated Soils
Location: PUC-Rio, In Rio de Janeiro, Brazil
Date: 25-01-2021 - 28-01-2021
Organiser: Tácio de Campos (PUC-Rio), Fernando Marinho (USP), Gilson Gitirana (UFG)
Contact person: Tácio de Campos
Email: panam2021unsat@puc-rio.br
Website: https://panamunsat2021.com

Mediterranean Symposium on Landslides
Location: Congressi Partenope, Naples, Italy, Naples
Date: 07-06-2021 - 09-06-2021
Language: English
Organiser: Gianfranco Urciuoli (Università di Napoli Federico II), Giovanni Crosta (Università di Milano Bicocca), Luciano Picarelli (Università della Campania L. Vanvitelli)
Contact person: Università di Napoli Federico II
Email: medsymplandslides@gmail.com
Website: https://medsymplandslides.wixsite.com/msl2021

The 1st International Conference on Sustainability in Geotechnical Engineering - Geodiversity & Resilience (1ST ICSGE’21)
Location: The Congress Center of LNEC Lisbon, Portugal, Lisboa
Date: 27-06-2021 - 30-06-2021
Organiser: The National Laboratory for Civil Engineering (LNEC)
Contact person: LNEC Congress Centre Secretariat
Address: Avenida do Brasil, 101 1700-066 Lisboa
Phone: (+351) 218 443 483
Email: formacao@lnec.pt
Website: http://icsge.lnec.pt/

6th Geochina International Conference 2021
Location: NanChang, China
Date: 19-07-2021 - 21-07-2021
Organiser: East China Jia Tong University in Cooperation with Chinese Ministry of Education, GeoChina Civil Infrastructure Association, University of Oklahoma
Contact person: Dr. Dar Hao Chen; Address: Texas Transportation Institute; Email: d-chen@tti.tamu.edu;
Website: http://geochina2021.geoconf.org; Email: geochina.adm@gmail.com
Event Diary (Con’t)

20th International Conference on Soil Mechanics and Geotechnical Engineering
Location: International Convention Centre Sydney, Australia
Date: 12-09-2021 - 17-09-2021
Language: English
Organiser: The Australian Geomechanics Society;
Contact person: ICMS Australasia;
Address: Level 9, 234 George Street Sydney NSW 200;
Email: emmab@icmsaust.com.au;
Website: http://www.icsmge2021.org/

NON-ISSMGE SPONSORED EVENTS

2020

Geoamerica 2020
Location: Windsor Convention Expo Center, Rio de Janeiro; Brazil
Date: 26-04-2020 - 29-04-2020
Language: English
Organiser: International Geosynthetics Society;
Contact person: André Estêvão Silva;
Email: geoamericas2020@geoamericas2020.com;
Website: http://www.geoamericas2020.com

DFI Deep Mixing 2020
Dates: 15-06-2020 - 17-06-2020
Location: TBD, Gdansk, Poland
Organizer: Deep Foundations Institute
Contact person: Theresa Engler
Address: 326 Lafayette Avenue, Hawthorne, NJ 07506, USA
Phone: 19734234030
Fax: 19734234031
Email: tengler@dfi.org
Website: http://www.dfi.org
Email: staff@dfi.org

The 3rd International Conference on Environmental Geotechnology, Recycled Waste Materials and Sustainable Engineering
Location: Dokuz Eylul University, Izmir, Turkey
Dates: 18-06-2020 - 20-06-2020
Organiser: Dokuz Eylul University
Contact person: Tugce Ozdamar Kul
Address: Dokuz Eylul University
Phone: +905325164800
Email: egrwse2020@gmail.com
Website: http://www.egrwse2020.com
Event Diary (Con’t)

16th International Conference of the International Association for Computer Methods and Advances in Geomechanics - IACMAG
Location: Politecnico di Torino Conference Centre, Italy ,
Date: 29-06-2020 - 03-07-2020  English
Organiser: Politecnico di Torino
Contact person: Symposium srl
Address: via Gozzano 14
Phone: +390119211467
Email: info@symposium.it
Email: marco.barla@polito.it

7th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics
Location: The National Science Seminar Complex, India, Bengaluru
Date: 13-07-2020 - 16-07-2020
Organiser: Indian Society of Earthquake Technology
Contact person: Dr Ravi Jakka
Address: Department of Earthquake Engineering, Indian Institute of Technology Roorkee
Phone: + 91-1332-285591
Email: jakkafeq@iitr.ac.in
Website: http://7icragee.org/index.php

16th International Conference of the International Association for Computer Methods and Advances in Geomechanics - IACMAG
Location: Politecnico di Torino Conference Centre, Italy ,
Date: 29-06-2020 - 03-07-2020
Organiser: Politecnico di Torino
Contact person: Symposium srl
Address: via Gozzano 14
Phone: +390119211467
Email: info@symposium.it; marco.barla@polito.it

Recent Trends in Geotechnical and Geo-Environmental Engineering and Education
Location: Bali, Indonesia
Date: 15 - 17 July 2020,
Organiser: RTEE Conference
Contact person: Amy Marshall ; Email: support@rtgee.org; Website: https://rtgee.org/

DFI 45th Annual Conference on Deep Foundations
Dates: 13-10-2020 - 16-10-2020
Location: Gaylord National Resort & Convention Center, Oxon Hill, MD, USA
Organizer: Deep Foundations Institute
Contact person: Theresa Engler
Address: 326 Lafayette Avenue, Hawthorne, NJ 07506, USA
Phone: 19734234030
Fax: 19734234031
Email: tengler@dfi.org
Website: http://www.dfi.org
Email: staff@dfi.org
Event Diary (Con’t)

Fifth World Landslide Forum
Dates: 02-11-2020 - 06-11-2020
Location: Kyoto International Conference Center, Kyoto, Japan
Organizer: International Consortium on Landslides
Contact person: Ryosuke Uzuoka
Address: Gokasho
Phone: +81-774-38-4090
Email: uzuoka.ryosuke.6z@kyoto-u.ac.jp
Website: http://wlf5.iplhq.org/
Email: secretariat@iclhq.org

FOR FURTHER DETAILS, PLEASE REFER TO THE WEBSITE OF THE SPECIFIC CONFERENCE
Corporate Associates

AECOM
AECOM Asia Company Ltd
8/F, Tower 2, Grand Central Plaza
138 Shatin Rural Committee Road
Shatin, NT
HONG KONG

Coffey Geotechnics
Coffey
Level 19, Tower B,
Citadel Towers
799 Pacific Highway
Chatswood NSW 2067 Australia

Dar Al Handasah Corp
Dar
Smart Village,
Cairo-Alexandria Desert Road
Street 26, Building 10
P.O. Box: 129, Giza 12577,
Egypt

Deltares
Deltares
PO Box 177
2600 AB Delft,
THE NETHERLANDS

GDS Instruments Sdn. Bhd.
GDS
124, Jalan Kapar 27/89, Section 27, Taman Alam Megah, 40400 Shah Alam, Selangor, Malaysia
https://www.gdsi.com.my/

Geomil Equipment BV
Geomil
12/F., Asia Trade Centre, 79 Lei Muk Road, Kwai Chung, NT, Hong Kong
http://geomil.com

Geoharbour Group
Geoharbour
Geoharbour Building, 6A, No.1228, Jiangchang Rd., Jing’an District, Shanghai, 200434, P.R.China.
Tel: +86 21 3126 1263
Fax: +86 21 2301 0238
Web: www.geoharbour.com

Golder Associates Inc
Golder
1000, 940-6th Avenue S.W.
Calgary, Alberta
CANADA T2P 3T1

Ground Investigation Ltd
Ground
Attn: Marco Holtrigter
PO Box 104-089,
Lincoln North
Auckland 0654
New Zealand
Corporate Associates (Con’t)

GHD Pty, Ltd.
57-63 Herbert Street
Artarmon NSW 2064
AUSTRALIA

Huesker Synthetic GmbH
Fabrikstrasse 13-15
48712 Gescher
GERMANY

GHD

International I.G.M. s.a.r.l.
P.O.Box: 16612 Achrafieh
Beirut
LEBANON

I.G.M.

Jan de Nul N.V.
Tragel 60, B-9308 Hofstade-Aalst
BELGIUM

Jan De Nul

Keller Ground Engineering
Level 1, 4 Burbank Place, Baulkham Hills
NSW 2153
PO Box 7974, Baulkham Hills NSW 1755
Australia

Keller

KGS Ltd,

KGS Astana

22 Chaikovskii St,
Temirtau City,
101403 Republic of Kazakhstan
http://kgs-astana.wixsite.com/society

MACCAFERRI

Maccferri
Via Kennedy 10
40069 Zola Predosa (Bologna)
ITALY

Maccferri

NAUE GmbH Co KG
Gewerbestrasse 2
32339 Espelkamp-Fiestel
GERMANY

NAUE GmbH Co KG

Norwegian Geotechnical Institute
P.O. Box 3930 Ullevaal Stadion
N-0806 OSLO
NORWAY

NGI

Pagani Geotechnical Equipment
Localita Campogrande 26
29010 Calendasco (PC)
Italy
www.pagani-geotechnical.com

Pagani

RCF Ltd
4C Ologun Agbeje
Victoria Island
Lagos,
Nigeria

RCF

SMEC Australia PTY ITD
Level 6, 480 St Pauls Tce Fortitude Valley
QLD 4006
www.smecc.com

SMEC

Siemens Energy
Kaiserleistrasse 10
63067 Offenbach
GERMANY

Siemens

SOLETANCHE BACHY SA
133 boulevard National, 92500 Rueil-Malmaison,
FRANCE

SOLETANCHE BACHY

SRK Consulting
Oceanic Plaza,
22nd Floor, 1066 West Hastings Street,
Vancouver, BC, Canada V6E 3X2

SRK

TenCate Geosynthetics
9, rue Marcel Paul
B.P. 4080
95873 Bezons Cedex
FRANCE

TenCate

Techfab India Industries Ltd
712 Embassy Centre
Nariman Point, Mumbai - 400021
Maharashtra, India
www.techfabindia.com

Techfab INDIA

ISSMGE Bulletin: Volume 14, Issue 1
Corporate Associates (Con’t)

Tensar International Ltd
Cunningham Court
Shadsworth Business Park
Blackburn, BB1 2QX,
UNITED KINGDOM

Terrasol
42/52 Quai de la Rapée - CS7123075583
Paris CEDEX 12
FRANCE

Terre Armée
280, avenue Napoléon Bonaparte
92506 Rueil Malmaison Cedex
France

Zetas Zemin Teknolojisi A.S
Merkez Mah. Resadiye Cad. No. 69/A
Alemdag, Umranıye
İstanbul, 34794
TURKEY

University of Wollongong
Northfields Ave,
Wollongong
NSW 2522
Australia

Wagstaff Piling
56 Tattersall Road,
Kings Park,
NSW 2148
Australia
The Foundation of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) was created to provide financial help to geo-engineers throughout the world who wish to further their geo-engineering knowledge and enhance their practice through various activities which they could not otherwise afford. These activities include attending conferences, participating in continuing education events, purchasing geotechnical reference books and manuals.

- **Diamond: $50,000 and above**
  b. Prof. Jean-Louis and Mrs. Janet Briaud [https://www.briaud.com](https://www.briaud.com) and [http://ceprofs.tamu.edu/briaud/](http://ceprofs.tamu.edu/briaud/)

- **Platinum: $25,000 to $49,999**

- **Gold: $10,000 to $24,999**
  c. Japanese Geotechnical Society [http://www.jiban.or.jp/](http://www.jiban.or.jp/)
  e. Korean Geotechnical Society [www.kgshome.or.kr](http://www.kgshome.or.kr)
  f. Comité Français de Mécanique des Sols et de Géotechnique [www.cfms-sols.org](http://www.cfms-sols.org)

- **Silver: $1,000 to $9,999**
  a. Prof. John Schmertmann
  b. Deep Foundation Institute [www.dfi.org](http://www.dfi.org)
  c. Yonsei University [http://civil.yonsei.ac.kr](http://civil.yonsei.ac.kr)
Foundation Donors (Con’t)

d. CalGeo - The California Geotechnical Engineering Association  
   www.calgeo.org

e. Prof. Ikuo Towhata  
   towhata.ikuo.ikuo@gmail.com  
   http://geotle.t.u-tokyo.ac.jp/

f. Chinese Taipei Geotechnical Society  
   www.tgs.org.tw

g. Prof. Zuyu Chen  
   http://www.iwhr.com/zswenglish/index.htm

h. East China Architectural Design and Research Institute  
   ECADI  
   http://www.ecadi.com/en/

i. TC 211 of ISSMGE for Ground Improvement  
   www.bbri.be/go/tc211

j. Prof. Askar Zhussupbekov  

k. TC302 of ISSMGE for Forensic Geotechnical Engineering  

l. Prof. Yoshinori Iwasaki  
   yoshi-iw@geor.or.jp www.geor.or.jp

m. Mr. Clyde N. Baker, Jr.

n. Prof. Hideki Ohta

o. Prof. Eun Chul Shin  
   www.incheo@incheon.ac.kr n.ac.krecshin

p. Prof. Tadatsugu Tanaka

q. ARGO-E (Geoengineer.org)  
   http://www.argo-e.com

- Bronze: up to $999

  a. Prof. Mehmet T. Tümay  
     mtumay@eng.lsu.edu  
     http://www.coe.lsu.edu/administration_tumay.html

  b. Nagadi Consultants (P) Ltd  
     www.nagadi.co.in

  c. Professor Anand J. Puppala  
     University of Texas Arlington  
     http://www.uta.edu/ce/index.php