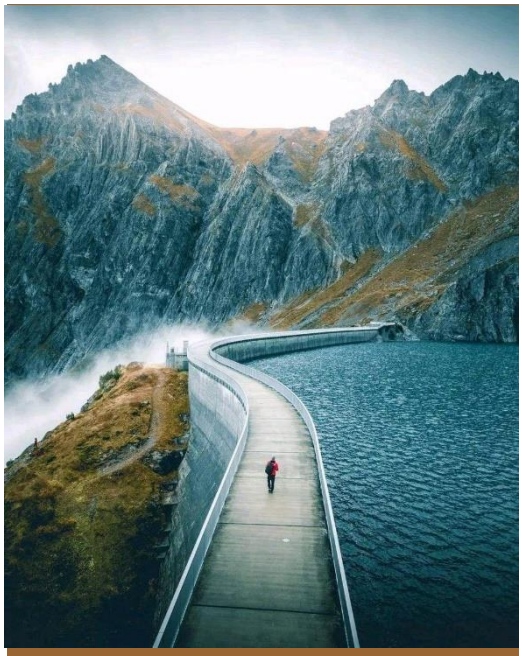

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Τα Νέα της Ε Ε Ε Ε Γ Μ

169

Αρ. 169 – ΝΟΕΜΒΡΙΟΣ 2022

Brecha de Saxer, part of the Sax-Schwende fault

ISSN: 2732-7248

Π Ε Ρ Ι Ε Χ Ο Μ Ε Ν Α

Άρθρα 3

- Africa is splitting in two – here is why 3

Νέα από τις Ελληνικές και Διεθνείς Γεωτεχνικές Ενώσεις 5

- International Society for Soil Mechanics and Geotechnical Engineering 5

  ISSMGE News & Information Circular November 2021 5

  ISSMGE TC309 Technical Forum of Young Scholars on Data-driven Modelling of Soil Behaviours with Geotechnical Applications 5

  The passing of Habib Fayad 6

  [Open Application] ISSMGE Interactive Technical Talk 6

  2nd ISSMGE TC217 Online Seminar Series: 3rd Seminar on 24th November 2022 7

  2nd ISSMGE TC217 Online Seminar Series: 4th Seminar on 8th December 2022 7

  9th International Course on Geotechnical and Structural Monitoring (02-06 May 2023) 7

  Bright Spark Lecture Awards at 16ICGE - Lahore, Pakistan, 7-8 December 2022 7

  Undrained shear strength of existing tailings dams 8

- International Society for Rock Mechanics and Rock Engineering 8

  News 8

  11th ISRM Young Members' Seminar 8

- International Tunnelling Association 9

  Scooped by ITA-AITES #79, 8 November 2022 9

  Scooped by ITA-AITES #80, 22 November 2022 9

- British Tunnelling Society 9

  HARDING MEMORIAL LECTURE 2022 Why did that happen? – Failures below ground 9

- British Tunnelling Society Young Members 10

  Re-thinking Tunnelling: Adjusting our Current Practices to New Norms 10

Προσεχείς Γεωτεχνικές Εκδηλώσεις: 11

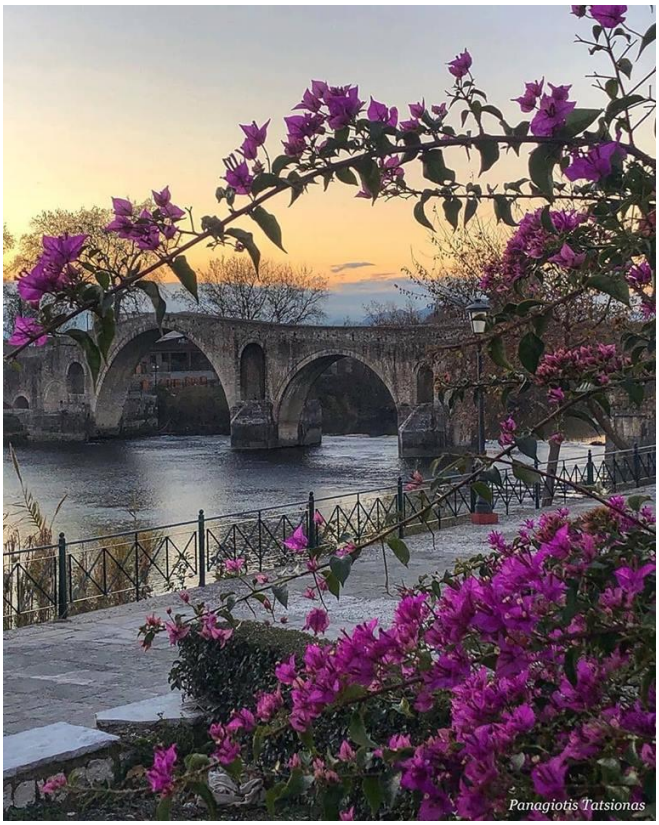
- 9th International Symposium on RCC Dams and CMDs 12
- EUROCK 2023 ISRM European Rock Mechanics Symposium - New challenges in rock mechanics and rock engineering 13

Ενδιαφέροντα Γεωτεχνικά Νέα 14

- Problem in the front yard of a house in Auckland, New Zealand 14
- Rockfall detection using LiDAR and deep learning 14

Ενδιαφέροντα – Σεισμοί & Αντισεισμική Μηχανική 15

- Human-induced M5.3 earthquake, series of aftershocks hit western Texas, U.S. 15



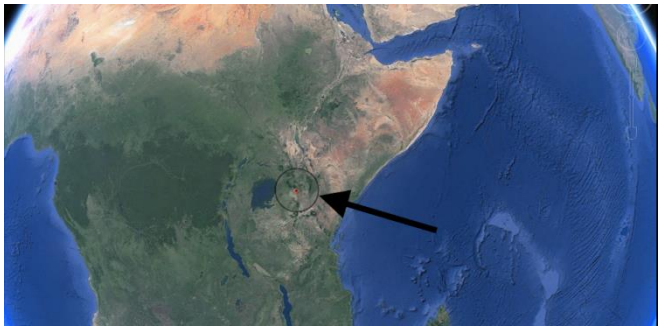
Γεφύρι Άρτας

A folded rock from Spain

ΑΡΘΡΑ

Africa is splitting in two – here is why

Lucía Pérez Díaz



A large crack, stretching several kilometres, made a sudden appearance recently in south-western Kenya. The tear, which continues to grow, caused part of the Nairobi-Narok highway to collapse. Initially, the appearance of the crack was linked to tectonic activity along the East African Rift. But although geologists now think that this feature is most likely an erosional gully, questions remain as to why it has formed in the location that it did and whether its appearance is at all connected to the ongoing East African Rift. For example, the crack could be the result of the erosion of soft soils infilling an old rift-related fault.

The Earth is an ever-changing planet, even though in some respects change might be almost unnoticeable to us. Plate tectonics is a good example of this. But every now and again something dramatic happens and leads to renewed questions about the African continent splitting in two.

The Earth's lithosphere (formed by the crust and the upper part of the mantle) is broken up into a number of tectonic plates. These plates are not static, but move relative to each other at varying speeds, "gliding" over a viscous asthenosphere. Exactly what mechanism or mechanisms are behind their movement is still debated, but are likely to include convection currents within the asthenosphere and the forces generated at the boundaries between plates.

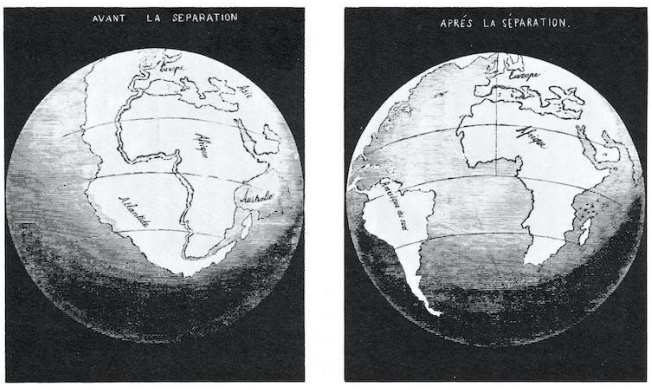
These forces do not simply move the plates around, they can also cause plates to rupture, forming a rift and potentially leading to the creation of new plate boundaries. The East African Rift system is an example of where this is currently happening.

The East African Rift Valley stretches over 3,000km from the Gulf of Aden in the north towards Zimbabwe in the south, splitting the African plate into two unequal parts: the Somali and Nubian plates. Activity along the eastern branch of the rift valley, running along Ethiopia, Kenya and Tanzania, became evident when the large crack suddenly appeared in south-western Kenya.

Great Rift Valley, Tanzania.

Why does rifting happen?

When the lithosphere is subject to a horizontal extensional force it will stretch, becoming thinner. Eventually, it will rupture, leading to the formation of a rift valley.

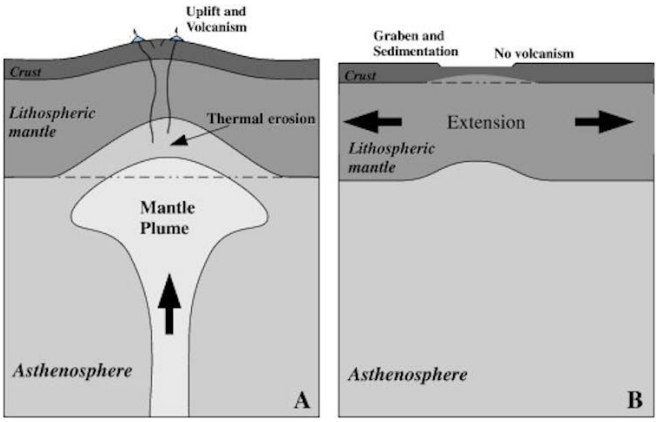


Maps made by Snider-Pellegrini in 1858 showing his idea of how the American and African continents may once have fitted together.

This process is accompanied by surface manifestations along the rift valley in the form of volcanism and seismic activity. Rifts are the initial stage of a continental break-up and, if successful, can lead to the formation of a new ocean basin.

An example of a place on Earth where this has happened is the South Atlantic ocean, which resulted from the break up of South America and Africa around 138m years ago – ever noticed how their coastlines match like pieces of the same puzzle?.

Continental rifting requires the existence of extensional forces great enough to break the lithosphere. The East African Rift is described as an active type of rift, in which the source of these stresses lies in the circulation of the underlying mantle. Beneath this rift, the rise of a large mantle plume is doming the lithosphere upwards, causing it to weaken as a result of the increase in temperature, undergo stretching and breaking by faulting.



Mantle plume (left).

Evidence for the existence of this hotter-than-normal mantle plume has been found in geophysical data and is often referred to as the "African Superswell". This superplume is not only a widely-accepted source of the pull-apart forces that are resulting in the formation of the rift valley but has also been used to explain the anomalously high topography of the Southern and Eastern African Plateaus.

Breaking up isn't easy

Rifts exhibit a very distinctive topography, characterised by a series of fault-bounded depressions surrounded by higher terrain. In the East African system, a series of aligned rift valleys separated from each other by large bounding faults can be clearly seen from space.

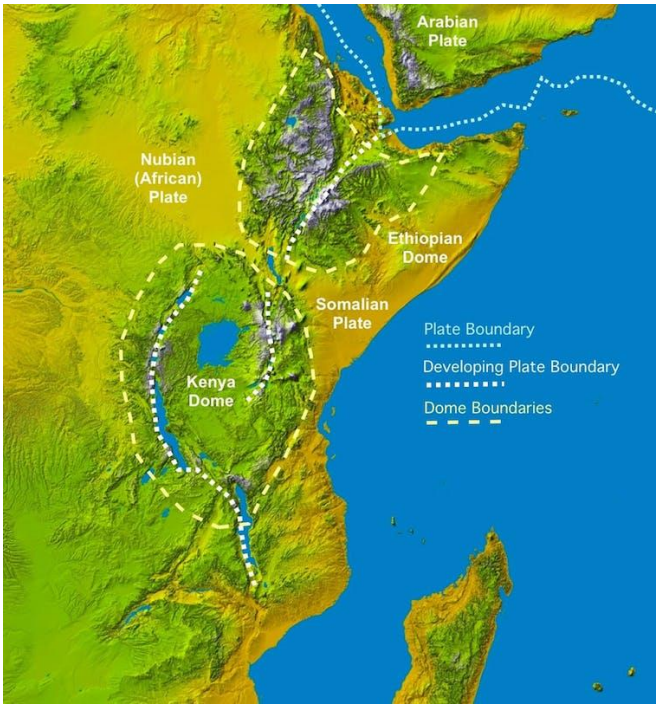
Not all of these fractures formed at the same time, but followed a sequence starting in the Afar region in northern Ethiopia at around 30m years ago and propagating southwards towards Zimbabwe at a mean rate of between 2.5-5cm a year.

Although most of the time rifting is unnoticeable to us, the formation of new faults, fissures and cracks or renewed movement along old faults as the Nubian and Somali plates continue moving apart can result in earthquakes.

However, in East Africa most of this seismicity is spread over a wide zone across the rift valley and is of relatively small magnitude. Volcanism running alongside is a further surface manifestation of the ongoing process of continental break up and the proximity of the hot molten asthenosphere to the surface.

A timeline in action

The East African Rift is unique in that it allows us to observe different stages of rifting along its length. To the south, where the rift is young, extension rates are low and faulting occurs over a wide area. Volcanism and seismicity are limited.



Topography of the Rift Valley.

Towards the Afar region, however, the entire rift valley floor is covered with volcanic rocks. This suggests that, in this area, the lithosphere has thinned almost to the point of complete break up. When this happens, a new ocean will begin forming by the solidification of magma in the space created by the broken-up plates. Eventually, over a period of tens of millions of years, seafloor spreading will progress along the entire length of the rift. The ocean will flood in and, as a result, the African continent will become smaller and there will be a large island in the Indian Ocean composed of parts of Ethiopia and Somalia, including the Horn of Africa.

Dramatic events, such as sudden motorway-splitting faults can give continental rifting a sense of urgency. However, rifting is a very slow process that, most of the time, goes about splitting Africa without anybody even noticing.

This article was updated and the headline changed on April 7 to reflect ongoing discussion by geologists about the cause of the large crack that appeared on the East Africa Rift and whether its location is related to the African continent split.

(THE CONVERSATION, March 29, 2018, https://theconversation.com/africa-is-splitting-in-two-here-is-why-94056)

ΝΕΑ ΑΠΟ ΤΙΣ ΕΛΛΗΝΙΚΕΣ ΚΑΙ ΔΙΕΘΝΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΝΩΣΕΙΣ

International Society for Soil Mechanics and Geotechnical Engineering

ISSMGE News & Information Circular November 2022

www.issmge.org/news/issmge-news-and-information-circular-November-2022

1. ISSMGE INTERACTIVE TECHNICAL TALKS: A NEW EDUCATIONAL INITIATIVE BY THE PRESIDENT OF ISSMGE

The President of ISSMGE Dr. Marc Ballouz has just launched a new educational initiative titled ISSMGE Interactive Technical Talks (IITT). It represents a series of technical talks to bring together geo professionals from around the world, young and renowned, from both the academia and the industry, to discuss a certain subject of geotechnical engineering. For more information and to view the first episode please go to https://www.issmge.org/news/issmge-interactive-technical-talks-a-new-educational-initiative-by-the-president-of-issmge.

2. ISSMGE TC309 Technical Forum of Young Scholars on Data-driven Modelling of Soil Behaviours with Geotechnical Applications

The Hong Kong Polytechnic University, in cooperation with ISSMGE TC309, is organising a half day Technical Forum of young scholars on Data-driven Modelling of Soil Behaviours with Geotechnical Applications on 25 November 2022. The event will be conducted online.

Machine learning assisted data-driven modelling has emerged as an alternative to complement current methods of modelling soil behaviours. This Forum will provide a platform for academics and practitioners to share insights and experience gained from research and practice. The Forum focuses on three themes, namely (1) Data-driven modelling of soil behaviours, (2) Physics-informed data-driven models, (3) Applications of data-driven models to geotechnical engineering practice.

Please see https://www.issmge.org/article/issmge-tc309-technical-forum-of-young-scholars-on-data-driven-modelling-of-soil-behaviours-with-geotechnical-applications for the link and a full programme.

3. Proceedings from the 11th International Symposium on Field Monitoring in Geomechanics available in open access

The Innovation and Development Committee of ISSMGE is pleased to announce that through the initiative of Dr. Andrew M. Ridley and the British Geotechnical Association, the 111 papers from the proceedings of the 11th International Symposium on Field Monitoring in Geomechanics (ISFMG2022 September 2022) are available in the ISSMGE Online Library here: https://www.issmge.org/publications/online-library.

4. ISSMGE BULLETIN

The latest edition of the ISSMGE Bulletin (Volume 16, Issue 5, October 2022) is available from the website.

5. ISSMGE FOUNDATION

The next deadline for receipt of applications for awards from the ISSMGE Foundation is the 31st January 2023. Click **here** for further information on the ISSMGE Foundation.

6. CONFERENCES

For a listing of all ISSMGE and ISSMGE supported conferences, and full information on all events, including deadlines, please go to the Events page at https://www.issmge.org/events. However, for updated information concerning possible changes due to the coronavirus outbreak (ie. postponements, cancellations, change of deadlines, etc), please refer to that specific events website.

The following are events that have been added or amended since the previous Circular:

ISSMGE EVENTS

INTERNATIONAL CONFERENCE ON ADVANCES IN STRUCTURAL AND GEOTECHNICAL ENGINEERING - 06-03-2023 - 09-03-2023 Titanic Palace Resort, Hurghada, Egypt; Language: English; Organiser: Structural Engineering Department - Tanta University; Contact person: Marawan Shahien; Address: Structural Engineering Department, Tanta University; Phone: +21005117064; Email: marawan.shahin@f-eng.tanta.edu.eg; Website: https://icasge.conferences.ekb.eg/; Email: icasge@unv.tanta.edu.eg

UNDERGROUND CONSTRUCTION PRAGUE 2023 - 29-05-2023 - 31-05-2023 Clarion Congress Hotel Prague, Czech Republic; Language: English; Organiser: The Czech Tunnelling Association ITA-AITES; Contact person: Czech Tunnelling Association ITA-AITES; Address: Koeluská 2450/4 Phone: +420 702 062 610; Email: pruskova@ita-aites.cz; Website: https://www.ucprague.com/; Email: masin@natur.cuni.cz

17TH ASIAN REGIONAL GEOTECHNICAL ENGINEERING CONFERENCE - 14-08-2023 - 18-08-2023 Astana, Kazakhstan; Language: English; Organiser: Kazakhstan Geotechnical Society; Contact person: Dr Assel Sarsembayeva; Address: 2, Satpayev Street, Eurasian National University, Geotechnical Institute; Phone: +7-7172- 344796; Fax: +7-7172-353740; Email: paper@17arc.org; Website: https://17arc.org/; Email: info@17arc.org

ISSMGE TC309 Technical Forum of Young Scholars on Data-driven Modelling of Soil Behaviours with Geotechnical Applications

Dongming Zhang / TC309 / 02-11-2022

The Hong Kong Polytechnic University, in cooperation with ISSMGE TC309, organises a half day Technical Forum of young scholars on Data-driven Modelling of Soil Behaviours

with Geotechnical Applications on 25 November 2022. The event will be conducted online.

Machine learning assisted data-driven modelling has emerged as an alternative to complement current methods of modelling soil behaviours. This Forum will provide a platform for academics and practitioners to share insights and experience gained from research and practice. The Forum focuses on three themes, namely (1) Data-driven modelling of soil behaviours, (2) Physics-informed data-driven models, (3) Applications of data-driven models to geotechnical engineering practice.

Zoom link:
https://polyu.zoom.us/j/99039249797?pwd=aERNTzBXRDd0NThvaHZ0MmNQeTkzZz09
Meeting ID: 990 3924 9797 **Passcode**: 835789

The Forum agenda is as follows:

Time (HK)	Speaker	Topic
16:00 – 16:10	Pin Zhang The Hong Kong Polytechnic University Derek Guotao Ma University of Warwick	Welcome
Invited technical presentations		
16:10 – 16:30	Filippo Masi École Centrale de Nantes France	Data- and thermodynamics-driven discovery of constitutive equations
16:30 – 16:50	Alex Xavier Jerves Norwegian Geotechnical Institute Norway	The role of machine learning in micromechanics based virtual laboratory testing
16:50 – 17:10	Mohammad Vahab University of New South Wales Australia	How physics-informed neural networks can leverage our understanding of conventional geotechnical and structural engineering problems
17:10 – 17:30	Zhengshou Lai Sun Yat-sen University China	Machine learning-enabled discrete element method for general-shaped particles: the extension to 3D, open source support and computational issues
17:30 – 17:50	Mengmeng Wu City University of Hong Kong Hong Kong, China	Constitutive modelling of granular materials using an approach integrating X-ray CT, DEM modeling and machine learning
17:50 – 18:10	*Health break*	
18:10 – 18:30	Xuzhen He University of Technology Sydney Australia	Deep learning for geotechnical surrogate modelling
18:30 – 18:50	Tongming Qu Hong Kong University of Science and Technology, Hong Kong, China	Deep active learning for constitutive modelling of granular materials: From representative volume elements to finite element modelling
18:50 – 19:10	Ning Zhang The Hong Kong Polytechnic University Hong Kong, China	Deep learning-based modelling method for monotonic stress-strain relationship of soils
19:10 – 19:30	Pin Zhang The Hong Kong Polytechnic University Hong Kong China	Practice of data-driven constitutive modelling of granular soils: from identification of particle assemblies to engineering applications
19:30 – 19:50	Seyed Farid Fazel Mojtahedi University of Melbourne Australia	Deep learning for time series forecasting in geotechnical engineering
19:50 – 20:10	Mohammad Sadegh Es-haghi Bauhaus-Universiät Weimar Germany	Machine learning-based estimation of soil's true air-entry value
20:10 – 20:30	Panel Discussions All invited lecturers and participants	Moderators: Pin Zhang Derek, Guotao Ma Alex Xavier Jerves

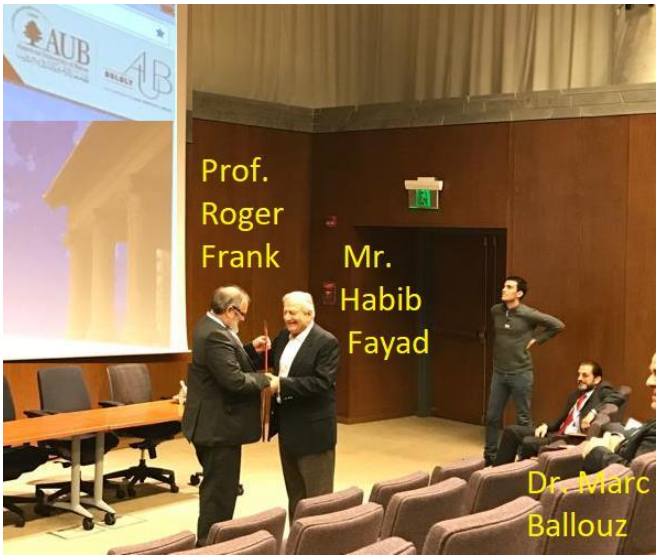
Time: Australia (+2); GB (-8); France/Germany/Norway (-7)

The passing of Habib Fayad

Neil Taylor / General / 07-11-2022

Habib Fayad, 89, passed peacefully on the 14th of October 2022 in the company of his family. Habib was born in Beirut Lebanon, and lived there for most of his life.

Habib Fayad obtained his civil engineering degree from ESIB in 1957 and started his career with TAMS in Beirut in their soil mechanics laboratory. In 1958, he started his own material testing laboratory CETEMAC and became the sole private accredited laboratory by the Government for quality control of all infrastructure works in Lebanon. In 1963, he founded Foundex with Dr. Terrence Searle. Foundex took over the laboratory and expanded its services to become the preferred soil consultant for many developers, engineers, and government entities. In 1975, the civil war started and Foundex gave way to a new company, Forex which, in addition to the consulting work, became active in shoring and small soil improvement projects. In 1995, he founded Edrafor which focused mainly on all types of special geotechnical works aimed at the emerging construction market in the center of Beirut. Edrafor later expanded to Syria, Qatar, the UAE, and now KSA. His sons, Philippe (MIT graduate) and Pierre are actively involved in the global growth and development of Edrafor.



Mr. Fayad is a pioneer in the field of geotechnical engineering in Lebanon and was well respected by his peers. He was honored by Prof. Roger Frank, the president of ISSMGE at the time during the 2017 Geotech Workshop at the American University of Beirut, in the presence of Dr. Marc Ballouz, the current president of ISSMGE.

Every person who has crossed Habibs path has kept the memory of a charismatic, respectful, wise, bright, and passionate man who loved the Geotech profession, his family and his country.

[Open Application]
ISSMGE Interactive Technical Talk

Ezra Tjung / Young Members / 15-11-2022

Call for Participants!!

The ISSMGE has rolled out a new initiative called the IITT (ISSMGE Interactive Technical Talk). This new initiative is to showcase interesting projects, in academia and industry, done by young Geotechnical Engineers. The ISSMGE hopes to encourage more young Geotechnical Engineers around the world to interact with one another through this new initiative. Selected young Geotechnical Engineers will be given the opportunity to do a presentation on one of the Technical Com-

mittee topics in an interactive section with other Geotechnical Engineers. An example of the talk can be viewed here: https://www.issmge.org/education/interactive-technical-talks/interactive-technical-talk-episode-1#

Interested persons can apply by sending an email to ympg.issmge@gmail.com

2nd ISSMGE TC217 Online Seminar Series: 3rd Seminar on 24th November 2022

Siau Chen Chian / TC217 / 21-11-2022

Following the success of the first seminar series last year, the executive committee of TC217 is hosting a 2nd series of land reclamation online seminars. The details of the 3rd seminar of the series are provided below.

Seminar Programme:

Title: Engineering Design of Empoldering System in Land Reclamation

Speaker: Dr Muthusamy Karthikeyan, Deputy Director (Coastal), Surbana Jurong International Consultants, Singapore

Date and Time: 24th November 2022, 7pm (GMT+8h)

Registration link: https://us06web.zoom.us/webinar/register/WN_EHoaevc-Qjmj03hAKzsfrA

Attendees of the full series of 5 seminars would be provided a certificate of attendance from the ISSMGE TC217 Chair as a gesture of appreciation of support to the seminars.

We look forward to receiving your registration and meeting you in the seminar.

Sincerely,
A/Prof Darren Chian
Secretary, TC217 Land Reclamation

2nd ISSMGE TC217 Online Seminar Series: 4th Seminar on 8th December 2022

Siau Chen Chian / TC217 / 21-11-2022

Following the success of the first seminar series last year, the executive committee of TC217 is hosting a 2nd series of land reclamation online seminars. The details of the 4th seminar of the series are provided below.

Seminar Programme:

Title: A case study of deep mixing for land reclamation in Hong Kong

Speaker: Anthony Wong, Senior Engineer, AECOM, Hong Kong

Time: 08th December 2022, 7pm (GMT+8h)

Registration link: https://us06web.zoom.us/webinar/register/WN_Y5Mncd2bR6-aE_NdxMVkgw

Attendees of the full series of 5 seminars would be provided a certificate of attendance from the ISSMGE TC217 Chair as a gesture of appreciation of support to the seminars.

We look forward to receiving your registration and meeting you in the seminar.

Sincerely,
A/Prof Darren Chian
Secretary, TC217 Land Reclamation

9th International Course on Geotechnical and Structural Monitoring (02-06 May 2023)

Andrew Ridley / TC220 / 22-11-2022

The ninth Edition of the International Course on Geotechnical and Structural Monitoring will feature this year a large Expo Area to showcase the newest instrumentation, and run real demos.

Several thematic Courses & Workshops will be organized by leading scientists in the field to stimulate exchange of the latest scientific knowledge and offer training in new techniques.

The IcGSM 2023 will be articulated with different participation formulas, allowing for a broad and more meaningful turnout of professionals, students, and representatives of large companies and institutions.

Bright Spark Lecture Awards at 16ICGE - Lahore, Pakistan, 7-8 December 2022

Ezra Tjung / Young Members / 23-11-2022

The YMPG in collaboration with the Organising Committee for the 16ICGE (16th International Conference on Geotechnical Engineering) would like to announce the winners of the Bright Spark Lecture Award to two distinguished young geotechnical engineers: Dr. Subhani Medawela and Dr. Shay Haq. They are both invited to give keynote lectures at the 16ICGE in Lahore, Pakistan, on 7-8 December 2022.

1. **Dr. Subhani Medawela (32 years old)**, Research Fellow, Faculty of EIT, University of Technology (UTS), Sydney, Australia

   Bright Spark Lecture Title: "Permeable reactive barriers for remediating acidic groundwater in pyritic terrain."

2. **Dr. Shay Haq (29 years old)**, Ph.D. from University of Technology (UTS), Sydney, Australia

   Bright Spark Lecture Title: "Particle scale modelling of internal instability."

The Bright Spark Lecture Award was established to promote young members of the ISSMGE to play a major role in various international and regional conferences. Recipients of this award are invited to give a keynote lecture at ISSMGE conferences. All Technical Committee conference organisers and Member Society conference organisers are encouraged to select Bright Spark Lecturers at their conferences. Details regarding the award can be found on the ISSMGE website: https://www.issmge.org/the-society/awards/bright-spark-lecture-award.

We invite everyone, especially young geotechnical engineers, to come and enjoy the lectures. We hope these lectures can inspire and motivate us further to excel in our beloved field, geotechnical engineering.

Winners Bio

Dr. Subhani Medawela

Subhani Medawela, a recipient of the International Postgraduate Tuition Award from the University of Wollongong (UOW), Australia, completed her doctoral degree under the supervision of distinguished professor Buddhima Indraratna. Subhani was awarded the Examiners` commendation for outstanding PhD thesis in 2020, and also won the Coffey-UOW award in 2019, awarded to the student with the best postgraduate performance in Geotechnical research. Also, she was one of the three finalists in the NSW Research Award competition organised by the Australian Geomechanics Society in 2018 to recognize outstanding research in NSW Universities. Upon completing her PhD in 2020, Subhani was appointed as the Research Fellow of a linkage project funded by Australian Research Council in collaboration with University of Technology Sydney and industry partners. Her research mainly focuses on Geo-Environmental solutions to treat contaminated groundwater in acidic terrains. Subhani has introduced innovative mathematical and numerical models to assess coupled bio-geochemical clogging of granular barriers used to treat acidic groundwater.

Dr. Shay Haq

Dr. Shay Haq received his PhD from the University of Technology Sydney (UTS), Sydney, Australia in 2022. He received funding for his PhD from the Australian Research Council and Transport Research Centre at UTS. He has published several Q1 journal papers from his PhD. He has a masters degree in Geotechnical Engineering from the Asian Institute of Technology (AIT), Bangkok, Thailand. He received Chin Fung Kee and AIT Alumni Association Awards during his masters studies at AIT. He obtained his bachelors degree in Civil Engineering from University of Engineering and Technology (UET), Lahore Pakistan. He was awarded with a gold medal for the best performance in the subjects of soil mechanics and foundation engineering during his bachelors degree program. He worked for two years in industry with National Engineering Services Pakistan (NESPAK) Pvt. Ltd. on various small- and large-scale dam projects including the rehabilitation and strengthening of Mangla reservoir rim.

Undrained shear strength of existing tailings dams

Roberto Cudmani / TC221 / 28-11-2022

The International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) Technical Committee TC221 on ***Tailings and Mine Waste*** organized an online debate/discussion on November 7th, 2022. This webinar about the evaluation of the undrained strength of tailings has been motivated by the results of the previous webinar on geotechnical aspects controlling the stability analysis of tailing dams. A pragmatic view of this issue is that there is a group of professionals working on tailings dams who believe that the evaluation of the undrained strength can be done through laboratory tests (eg, triaxial, simple shear, direct shear) in combination with field tests (eg, SCPTu, SPT, Vane Shear, Vs). On the other hand, there is a view that this topic is highly complex due to the high stratification, unsaturated conditions, granulometric differences, aging and variation in the void ratio, among other factors, that real tailings deposits present, so more research would be needed to develop more effective methodologies to take into account the complex reality of tailings. These two technical visions were presented during the webinar.

Please find the abstracts of the presentations in the file with this link.

The webinar has been recorded. The video can be started with this link.

ISRM International Society for Rock Mechanics and Rock Engineering

News

https://www.isrm.net

11th ISRM Young Members' Seminar 2022-11-25

The ISRM Young Members' Seminar (YMS) Series is an ISRM Young Members Group initiative: a series of virtual events to provide a global platform for ISRM young members to share knowledge, experiences, and ideas. More info on the YMS is available here.

The 11th ISRM Young Members' Seminar will take place on 6 December at 3 PM UTC, with speakers from Canada and South Africa:

- Structural mechanism contributing to large-scale hangingwall instabilities on the UG2 reef horizon - Alida Hartzenberg (SRK Consulting, Canada)

- Establishing a testing criteria to relate the in-situ performance of static and dynamic capable mesh - Jean Pierre Gouvea (Goldfields, South Africa)

You can join using the Zoom link created for each Seminar and participate in the question and answers period. The Seminars will also be live-streamed to the ISRM YM's YouTube channel, where they will be stored. **Click here to download the flyer**.

Stay tuned for details on the next edition from the YMS organising committee.

Sevda Dehkhoda
Chair of the ISRM Young Members Committee

Scooped by ITA-AITES #79, 8 November 2022

China TBM completes 3km tunnel

Construction of Polihali dam and transfer tunnel set to start | Lesotho

Iran to start construction of Kajaran tunnel in Armenia in 2023 spring

An organic farm sprouts inside an underground train station in Taiwan

Niagara Falls' previously off-limits tunnel now open to the public | Canada

Plans for underground rail tunnel under Birmingham city centre announced | UK

Metro Rail to take up tunnelling work in Greenways road soon | India

East-West Metro project - East-West Metro tunneling work yet to resume | India

Sydney roads: Major U-turn in construction plans for Western Harbour Tunnel | Australia

Manila Water launches first microtunneling project in Mandaluyong City | Philippines

Scooped by ITA-AITES #80, 22 November 2022

Toronto's Ontario Line project advances | Canada

Underground lab is built 1,000 meters below surface in S. Korea to research space particles | South Korea

BMRCL plans first underground depot in Baiyappanahalli | India

Underground tunnels that carry water from Lake District to Lancashire being upgraded | UK

Space exploration goes underground

British Land plans underground London logistics hub | UK

Swiss tunnel construction hits up against military bunker

TKO-Lam Tin Tunnel opens in December | Hong-Kong, China

Independent study confirms VTA plans for single bore tunnel | United States of America

Bandra Kurla Complex longest station of Mumbai's underground Metro line 3 | India

HARDING MEMORIAL LECTURE 2022
Why did that happen? – Failures below ground

Speaker : Mike King

Thursday 17 th November 2022 at 18:00 hrs [UTC]

Sir Harold Harding was one of three members serving on the panel investigating the Aberfan colliery waste landslide. This tragedy, taking the lives of 28 adults and 116 children, remains in our conscious memory, but do we recall the cause and the lessons the catastrophe should have taught us? Do we really understand why some projects fail and subsequently expend considerable time and resources investigating, disputing and defending "positions", or resisting honest and open discussion in circumstances that might have been avoided? And win or lose even in a minor dispute, any resulting investigation can be disruptive, intrusive, and expensive, but ultimately teach the industry as a whole, very little.

In this talk Mike looks at some of the data related to root causes of failures in underground projects, considers his personal experience and appraises whether we are honestly capturing the real issues behind these events, and if we could do more to disseminate lessons. Two failures are examined as representative examples, one very well known to the industry.

This is an in-person event which can also be streamed online at: https://youtu.be/4ii22FREfHM

BTSYM AGM & Evening Lecture
Re-thinking Tunnelling: Adjusting our Current Practices to New Norms

Speakers: Dr Chrysothemis Paraskevopoulou

The increase in world population and the development of metropolises and megacities have imposed the underground space's exploitation, contributing to emerging underground space development. Especially during the last decade in the underground and tunnelling industry world market, there has been a 5-7% annual increase with mainly China and India, governing more than 50% of the market share. As a result, engineers, geoscientists are constantly confronted with new problems and challenges they must overcome (or avoid). Due to this market increase, there is an urgent need for design optimisation of such structures to reduce construction costs while targeting the projects' sustainability. Thus, it is necessary to redefine the design boundaries of current practices. The presentation discusses specific challenges, such as long-term (time-dependent) behaviour, uncertainty, sustainability etc., which are currently more and more common in tunnelling. Finally, it proposes solutions utilising the acquired knowledge from empirical methods and combining it with numerical analysis techniques.

Note: This in-person lecture will also be streamed live at https://youtu.be/2hmeBArxJ_8

ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

Για τις παλαιότερες καταχωρήσεις περισσότερες πληροφορίες μπορούν να αναζητηθούν στα προηγούμενα τεύχη του «περιοδικού» και στις παρατιθέμενες ιστοσελίδες.

2022 GEOASIA7 - 7th Asian Regional Conference on International Geosynthetics Society, October 31 – November 4, 2022, Taipei, Taiwan, www.geoasia7.org

ATC 2023 18th Australasian Tunnelling Conference 2023 Trends and Transitions in Tunnelling, November 5 - November 8, Auckland, New Zealand, https://atc2023.com

cGts - 50th jubilee Annual conference GEOTECHNICAL ENGINEERING AROUND US AFTER 50 YEARS, 14th and 15th November 2022, Brno, Czech Republic, www.cgts.cz/en

CouFrac 2022 - 3rd International Conference on Coupled Processes in Fractured Geological Media: Observation, Modeling, and Application, November 14-16, 2022, Berkeley, California, USA, https://coufrac2022.org

Piling & Ground Improvement Conference 2022, November 16-18, 2022, Sydney, Australia, https://events.americantradeshow.com/pilingconference2022

AUSROCK Conference 2022, 6th Australasian Ground Control in Mining Conference –an ISRM Regional Symposium, 29 November – 1 December 2022, Melbourne, Australia, www.ausimm.com/conferences-and-events/ausrock/

16th ICGE 2022 – 16th International Conference on eotechnical Engineering, Lahore, Pakistan, 8-9 December, 2022, https://16icge.uet.edu.pk/

#GROUT22 6th International Conference on Grouting and Deep Mixing, January 15-18, 2023, New Orleans, USA, https://www.dfi.org/grout2022

ATA GEOSYNTHETICS CONFERENCE, Feb. 5-8, 2023, Kansas City, MO USA, https://geosyntheticsconference.com

4th African Regional Conference on Geosynthetics – Geosynthetics in Sustainable Infrastructures and Mega Projects, 20-23 February 2023, Cairo, Egypt, www.geoafrica2023.org

ASIA 2023, 14 - 16 March 2023, Kuala Lumpur, Malaysia, www.hydropower-dams.com/asia-2023

3rd International Conference TMM_CH "Transdisciplinary Multispectral Modelling and Cooperation for the Preservation of Cultural Heritage: Recapturing the World in Conflict through Culture, promoting mutual understanding and Peace", 20-23 March 2023, Athens, Greece, www.tmm-ch.com

Conference on Foundation Decarbonization and Re-use, March 21-23, 2023, Amsterdam, Netherlands, www.dfi.org/2023-conference-on-foundation-decarbonization-reuse

88th ICOLD Annual Meeting & Symposium on Sustainable Development of Dams and River Basins, April 2023, New Delhi, India, https://www.icold2020.org

Rocscience International Conference 2023 Synergy in Geotechnical Engineering, April 24-26, 2023, Toronto, Canada, www.rocscience.com/events/rocscience-international-conference-2023

UNSAT 2023 - 8th International Conference on Unsaturated Soils, 2-5 May 2023, Milos island, Greece, www.unsat2023.org

World Tunnel Congress 2023 Expanding Underground Knowledge & Passion to Make a Positive Impact on the World, 12 - 18 May 2023, Athens, Greece, https://wtc2023.gr

NROCK2022 - The IV Nordic Symposium on Rock Mechanics and Rock Engineering, 24 – 25 May 2023, Reykjavic, Iceland, www.nrock2023.com

Underground Construction Prague 2023, May 29 – 31, 2023, Prague, Czech Republic, www.ucprague.com

17DECGE Danube – European Conference on Geotechnical Engineering, 7-9 June 2023, Bucharest, Romania, https://17decge.ro

SuperPile'23 Piling Design & Construction Conference, June 7-9, 2023, Atlanta, USA, www.dfi.org/superpile2023

3rd JTC1 Workshop on "Impact of global changes on landslide risk",7 – 10 June 2023, Oslo, Norway, https://jtc1-2023.com

ICOLD Annual Meeting 2023, 12th to 15th June 2023 Gothenburg, Sweden, https://icold-cigb2023.se

9th International Congress on Environmental Geotechnics Highlighting the role of Environmental Geotechnics in Addressing Global Grand Challenges, 25-28 June 2023, Chania, Crete island, Greece, www.iceg2022.org

DFHM8 TORINO 2023 8th International Conference on Debris Flow Hazard Mitigation, 26-29 June 2023, Torino, Italy, http://dfhm8.polito.it

NUMGE 2023 - Numerical Methods in Geotechnical Engineering 2023, 26 - 28 June 2023 Imperial College London, UK, www.imperial.ac.uk/numerical-methods-in-geotechnical-engineering

AFRICA 2023 - The Fourth International Conference and Exhibition on Water Storage and Hydropower Development for Africa, 10-12 July 2023, Lake Victoria, Uganda, www.hydropower-dams.com

S3: Slopes, Support and Stabilization Conference, August 8-10, 2023, Boston, USA, www.dfi.org/s32023

17ARC 17th Asian Regional Geotechnical Engineering Conference, 14-18 August 2023, Nur-Sultan, Kazakhstan, https://17arc.org

ISMLG 2023 – 4th International Symposium on Machine Learning & Big Data in Geoscience, 29 August - 1 September 2023, University College Cork, Ireland, www.ismlg2023.com

IS-PORTO 2023 8th International Symposium on Deformation Characteristics of Geomaterials, 3rd - 6th September 2023, Porto, Portugal, www.fe.up.pt/is-porto2023

12th ICOLD European Club Symposium "Role of dams and reservoirs in a successful energy transition", 5 to 8 September 2023, Interlakes, Switzerland, www.ecsymposium2023.ch

SUT OSIG 9th International Conference "Innovative Geotechnologies for Energy Transition", 12-14 September 2023, London, UK, www.osig2023.com, www.sut.org

SAHC 2023 13th International Conference on Structural Analysis of Historical Constructions "Heritage conservation across boundaries", 12-15 September 2023, Kyoto, Japan, https://sahc2023.org/

XII ICG - 12th International Conference on Geosynthetics, September 17 – 21, 2023, Rome, Italy, www.12icg-roma.org

SEG23 Symposium on Energy Geotechnics, 3-5 October 2023, Delft, The Netherlands, https://seg23.dryfta.com

28th European Young Geotechnical Engineers Conference and Geogames

04 – 07 October 2023, Moscow, Russia

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

2023 15th ISRM Congress, International Congress in Rock Mechanics Challenges in Rock Mechanics and Rock Engineering, 9÷14 October 2023, Salzburg, Austria, https://www.isrm2023.info/en/

HYDRO 2023 New Ideas for Proven Resources, 16-18 October 2023, Edinburgh, Scotland, www.hydropower-dams.com/hydro-2023

ACUUS SINGAPORE 2023 18th Conference of the Associated Research Centers for the Urban Underground Space "Underground Space – the Next Frontier", 1 - 4 Nov 2023, Singapore, www.acuus2023.com

6th World Landslide Forum "Landslides Science for sustainaible development", 14 to 17 November 2023, Florence, Italy, https://wlf6.org

CREST 2023 – 2nd Construction Resources for Environmentally Sustainable Technologies, November 20-22, 2023, Fukuoka, Japan, https://www.ic-crest.com

GEOTEC HANOI 2023 The 5th International Conference on Geotechnics for Sustainable Infrastructure Development, December 14-15, 2023 - Hanoi, Vietnam, https://geotechn.vn

9th International Symposium on RCC Dams and CMDs

December, 2023, Guangzhou, China

www.chincold-smart.com/meetings/rcc2023

Spanish National Committee on Large Dams (SPANCOLD), Japan Commission on Large Dams (JCOLD) and Chinese National Committee on Large Dams (CHINCOLD) have the honor to invite professionals to the 9th International Symposium on Roller Compacted Concrete (RCC) Dams and Cemented Material Dams, which will be held in December, 2023 in Guangzhou City, China.

RCC dams have the virtues of saving a great deal of concrete, building quickly, making project cost down and early bringing into playing project advantages and so on. Hence, the technique of constructing dams has been quickly spread and applied since it came out. Today there are more than 400 RCC dams in more than 40 countries. Great successful experiences and advanced technologies have been achieved. CHINCOLD and SPANCOLD have devoted to promote the technology from early 1990's. The first Symposium on RCC dams was jointly organized by the two committees in 1991 in Beijing China, which was a success start of the series of RCC Symposiums.

Cemented Material Dam (CMD) is a new type of dams, which includes Hardfill dam, Cemented Sand and Gravel dam (CSG), Cemented Sand, Gravel and Rock dam (CSGR), Rockfilled Concrete dam (RCD), Cemented Soil dam (CSD), and so on. There are more than 200 CMD projects constructed and under construction.

The 9th International Symposium on Roller Compacted Concrete (RCC) Dams and Cemented Material Dams will provide a platform for practitioners, engineers, researchers, scientists, managers and decision makers from all over the world to exchange ideas and technology about the latest developments dealing with RCC dams and CMDs. Beside international best practice, the participants will also have the occasion to visit some famous RCC dams and CMDs in China in operation or under construction.

Topics

Practitioners, engineers, researchers, scientists, managers and decision makers from all over the world to exchange ideas and technology about the latest developments dealing with RCC dams.

- Innovation and mix proportion of RCC Dams and CMDs materials
- Design and construction development of RCC Dams and CMDs
- Application of roller compacted concrete and cemented materials in the dam protection against overtopping
- Rehabilitation technology of RCC Dams and cases
- Application of digitization and artificial intelligence technology
- Others

Contact US

Registration forms, CV, papers and correspondence concerning on the 9th International Symposium on RCC Dams and CMDs could be sent to Secretariat as the following,

Dr. Lifeng ZHENG, Dr. Aili LI
Secretariat of RCC 2019
Chinese National Committee on Large Dams
Room 1266, IWHR Building A, A1 Fuxing Rd., Beijing 100038, P.R. China

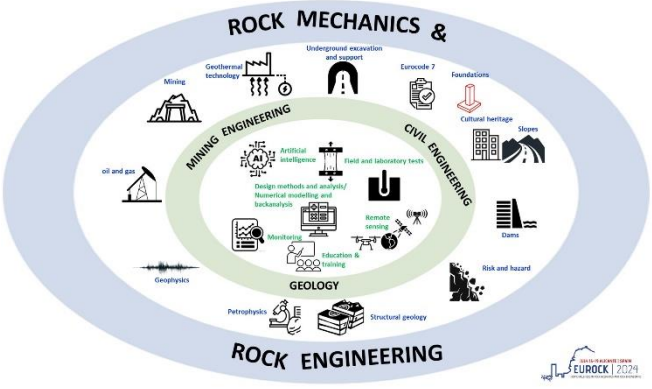
Tel: 86 10-68781609
Cell Phone: +86 13811499665
Fax: +86-10-68712208
Email: chincold-en@vip.126.com; chincolden@gmail.com

World Tunnel Congress 2024 19 to 25, April, 2024, Shenzhen China, www.wtc2024.cn

8th International Conference on Earthquake Geotechnical Engineering (8ICEGE), 7-10 May, 2024 Osaka, Japan, https://confit.atlas.jp/guide/event/icege8/top?lang=en

ISRM European Rock Mechanics Symposium
New challenges in rock mechanics and rock engineering
July 15-19, 2024, Alicante, Spain
www.eurock2024.com

Topics



- Rock properties, testing methods and site characterization
- Rock mechanics for infrastructures
- Mining rock mechanics and rock engineering
- Design methods and analysis
- Rock mechanics for heritage
- Geophysics in rock mechanics
- Numerical modelling and backanalysis
- Monitoring and backanalysis
- Underground excavation and support
- Risk and hazard
- Applicability of EUROCODE-7 in rock engineering
- Geomechanics for the oil and gas industry
- Ores, building and industrial rocks
- Application of artificial intelligence to problems of rock mechanics
- Remote sensing in rock mechanics
- Geothermal technology
- Rock Mechanics education and training

Contact

Tel. +34 96 590 3793
Email: eurock2024@csidiomas.ua.es

ECSMGE 24 XVIII European Conference on Soil Mechanics and Geotechnical Engineering, 26-30 August 2024, Lisbon, Portugal, www.ecsmge-2024.com

PANAMGEO CHILE 2024 17th Pan-American Conference on Soil Mechanics and Geotechnical Engineering, La Serena, Chile, https://panamgeochile2024.cl

21st International Conference on
Soil Mechanics and Geotechnical Engineering
14 – 19 June 2026, Vienna, Austria

Organisers:

Austrian Geotechnical Society and Austrian Society for Geomechanics

Contact person: Prof. Helmut F. Schweiger

Email: helmut.schweiger@tugraz.at

ΕΝΔΙΑΦΕΡΟΝΤΑ ΓΕΩΤΕΧΝΙΚΑ ΝΕΑ

Problem in the front yard of a house in Auckland, New Zealand

This was taken in Auckland. The house is two years old but had only been occupied for four weeks when a fairly deep-seated rotational slip occurred in the fill platform that had been placed for the building. The site is on the side of a valley with a residually weathered clay mantle overlying sandstone, and a cut-fill platform for the house.The owners were understandably very upset. Fortunately their house was on piles, so was undamaged, but all their services were lost so the house was uninhabitable for many months. Ross suspects that the fill was not well compacted, and probably moved a little in wet weather causing damage to the services. Once the owners moved in, and turned on the water supply, the damaged pipes would have quickly exacerbated the situation. A very large soldier pile wall has since been built in front of the house to restore a few metres of land and the services.

The photo was submitted by Ross Roberts, an engineering geologist in Auckland, New Zealand

IAEG Connector E-News, November 3, 2022

Rockfall detection using LiDAR and deep learning

Ioannis Farmakis, Paul-Mark Di Francesco, D. Jean Hutchinson, Nicholas Vlachopoulos

Highlights

- LiDAR monitoring provides detailed 3D point cloud models of rock slope deformations.
- High-level feature learning from point clouds is achieved with modern deep learning.
- Rockfall detection can be approached as a binary point cloud classification problem.
- Global shape feature learning is suggested compared to local texture features.
- The prediction confidence increases with the cluster volume.

Abstract

Rockfall risk management has traditionally been built upon scenarios based on statistical analysis of historic frequency-magnitude rockfall patterns which allows for an estimation of the return period of rockfalls within given ranges of magnitude. The availability of rockfall databases is thereby of crucial importance to quantify rockfall activity. In recent years, engineering geologists have been able to leverage light detection and ranging (LiDAR) technology with automated change detection and clustering workflows, for spatially accurate rockfall monitoring and inventorization. This wealth of digital data generates new research prospects for the development of an artificial intelligence (AI) system able to analyze change detection sequences and map spatio-temporal rockfall patterns by precisely capturing the rock slope evolution in near-real-time. However, prerequisite to such an advancement is the need to efficiently automate the process of classifying surface changes corresponding to rockfall. This task typically requires intensive human effort and is prone to multiple sources of human error like subjectivity, expertise, and experience that may differ from person to person involved in a particular project. This paper investigates the potential of integrating sophisticated deep learning architectures into dynamic rockfall database population processes, with the goal of relieving experts from the daunting task of manually classifying rockfall events within large loads of change detection data. Deep neural networks based on the pioneering PointNet and PointNet++ architectures for 3D point cloud learning are developed for this purpose based on a 5-year change detection database consisting of >8000 rock slope clusters of identified change for training, with scanning intervals ranging from 5 days to 6 months. The models are tested on the 536 clusters from the two last data acquisitions to simulate the real monitoring situation and subsequently on the most frequent of the campaigns to increase the probability of working with single-event clusters. The best-performing model achieves an accuracy of about 89% and 84% on the last and shortest campaign, respectively. The optimized deep learning models are further evaluated on a geologically different rockfall database achieving almost 93% accuracy in a location where discrete geomorphologic features such as steep rock outcrops and erosion channels are present. The study shows that although it is challenging to achieve generalization in rockfall detection, site-specific training of the proposed deep learning architecture can lead to high-level performance and support further advancements in rockfall risk management.

https://doi.org/10.1016/j.enggeo.2022.106836

(Engineering Geology, Volume 309, November 2022, 106836, https://www.sciencedirect.com/science/article/abs/pii/S0013795222003210?via%3Dihub)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΣΕΙΣΜΟΙ & ΑΝΤΙΣΕΙΣΜΙΚΗ ΜΗΧΑΝΙΚΗ

Human-induced M5.3 earthquake, series of aftershocks hit western Texas, U.S.

A shallow earthquake, registered by the USGS as M5.3, hit western Texas at 21:32 UTC on November 16, 2022. The agency is reporting a depth of 8.3 km (5.1 miles). The quake was followed by a series of aftershocks, with magnitudes ranging from 2.6 to 4.1.

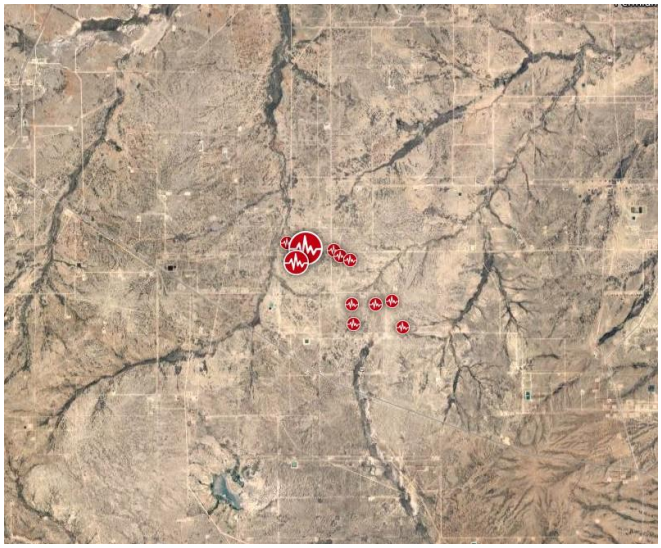
The epicenter was located 39.2 km (24.3 miles) WSW of Mentone (population 19), Texas, and 90 km (56 miles) SSE of Carlsbad (population 28 957), New Mexico.

According to the USGS PAGER, 397 000 people are estimated to have felt light shaking.

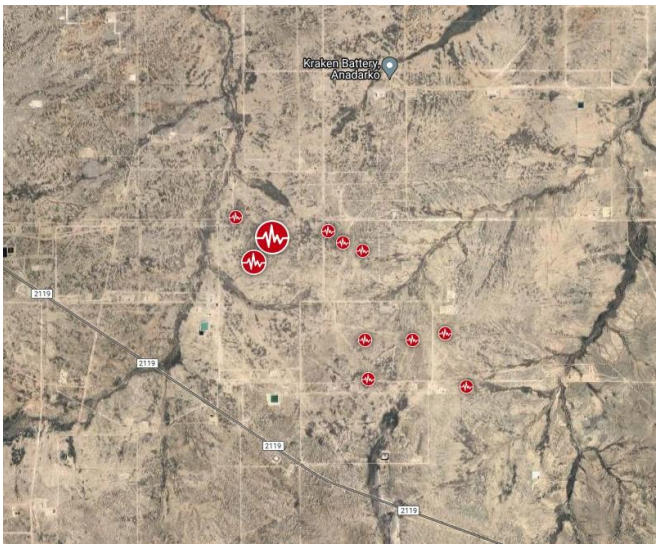
A Green alert was issued for shaking-related fatalities and economic losses. There is a low likelihood of casualties and damage.

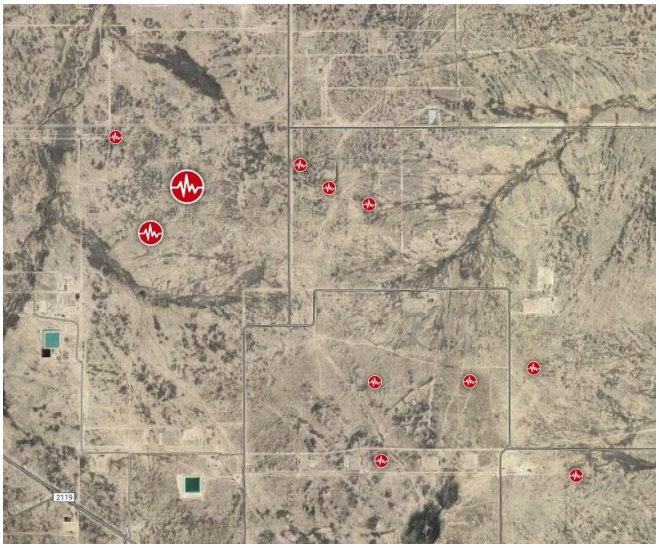
Overall, the population in this region resides in structures that are resistant to earthquake shaking, though vulnerable structures exist. The predominant vulnerable building types are unreinforced brick masonry and reinforced masonry construction.

Light damage was reported in the region.



The largest known earthquake to hit Texas was M6.0 in the town of Valentine, near Marfa, in 1931.





The quake occurred in the same area where a human-induced M5.0 earthquake hit on March 26, 2022. This was the third-largest earthquake recorded in Texas and the largest earthquake in the Central and Eastern United States since the three M5.0 – 5.8 induced events in Oklahoma in 2016.

M4+ earthquakes in west Texas since 1950.

"Using multistation waveform template matching, we detect 3 940 earthquakes in the sequence with the first event in the area occurring in May 2018… We find that the sequence was most likely induced by nearby wastewater disposal operations, and seismicity rates in the region surrounding the M5.0 will likely continue to increase in the future if disposal operations continue unaltered."[1]

"This area of western Texas was historically very quiet, but has had 375 M≥3 quakes beginning in 2019," said Dr. Lucy Jones — one of the world's most recognizable seismologists.[2]

"This is the type of pattern that suggests the quakes are induced by pumping fluids into the ground. This is not too big to be induced."

Jones was a USGS seismologist for 33 years.

Induced seismicity

As is the case elsewhere in the world, there is evidence that some central and eastern North America earthquakes have been triggered or caused by human activities that have altered the stress conditions in the earth's crust sufficiently to induce faulting.[3]

Activities that have induced felt earthquakes in some geologic environments have included the impoundment of water behind dams, injection of fluid into the earth's crust, extraction of fluid or gas, and removal of rock in mining or quarrying operations.

In much of eastern and central North America, the number of earthquakes suspected of having been induced is much smaller than the number of natural earthquakes, but in some regions, such as the south-central states of the U.S., a significant majority of recent earthquakes are thought by many seismologists to have been human-induced.

Even within areas with many human-induced earthquakes, however, the activity that seems to induce seismicity at one location may be taking place at many other locations without inducing felt earthquakes.

In addition, regions with frequent induced earthquakes may also be subject to damaging earthquakes that would have occurred independently of human activity.

Making a strong scientific case for a causative link between a particular human activity and a particular sequence of earthquakes typically involves special studies devoted specifically to the question.

Such investigations usually address the process by which the suspected triggering activity might have significantly altered stresses in the bedrock at the earthquake source, and they commonly address the ways in which the characteristics of the suspected human-triggered earthquakes differ from the characteristics of natural earthquakes in the region.

References:

[1] The induced Mw 5.0 March 2020 west Texas seismic sequence – USGS – December 4, 2020

[2] From a Twitter post published by Dr. Lucy Jones on November 16, 2022

[3] M5.3 earthquake – 39 km WSW of Mentone, Texas – USGS – November 16, 2022

(THE WATCHERS, Thursday, November 17, 2022, https://watchers.news/2022/11/17/human-induced-m5-3-earthquake-series-of-aftershocks-hit-western-texas-u-s/)

ΕΚΤΕΛΕΣΤΙΚΗ ΕΠΙΤΡΟΠΗ ΕΕΕΕΓΜ (2019 – 2023)

Πρόεδρος	:	Μιχάλης ΜΠΑΡΔΑΝΗΣ, Δρ. Πολιτικός Μηχανικός, ΕΔΑΦΟΣ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Α.Ε. mbardanis@edafos.gr, lab@edafos.gr
Α' Αντιπρόεδρος	:	Χρήστος ΤΣΑΤΣΑΝΙΦΟΣ, Δρ. Πολιτικός Μηχανικός, ΠΑΝΓΑΙΑ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Ε.Π.Ε. editor@hssmge.gr, ctsatsanifos@pangaea.gr
Β' Αντιπρόεδρος	:	Μιχάλης ΠΑΧΑΚΗΣ, Πολιτικός Μηχανικός mpax46@otenet.gr
Γενικός Γραμματέας	:	Γιώργος ΜΠΕΛΟΚΑΣ, Δρ. Πολιτικός Μηχανικός, Επίκουρος Καθηγητής ΤΕΙ Αθήνας gbelokas@teiath.gr, gbelokas@gmail.com
Ταμίας	:	Γιώργος ΝΤΟΥΛΗΣ, Πολιτικός Μηχανικός, ΕΔΑΦΟΜΗΧΑΝΙΚΗ Α.Ε.- ΓΕΩΤΕΧΝΙΚΕΣ ΜΕΛΕΤΕΣ Α.Ε. gdoulis@edafomichaniki.gr
Έφορος	:	Γεώργιος ΓΚΑΖΕΤΑΣ, Δρ. Πολιτικός Μηχανικός, Ομότιμος Καθηγητής Ε.Μ.Π. gazetas@central.ntua.gr, gazetas50@gmail.com
Μέλη	:	Ανδρέας ΑΝΑΓΝΩΣΤΟΠΟΥΛΟΣ, Δρ. Πολιτικός Μηχανικός, Ομότιμος Καθηγητής ΕΜΠ aanagn@central.ntua.gr
		Παναγιώτης ΒΕΤΤΑΣ, Πολιτικός Μηχανικός, ΟΜΙΛΟΣ ΤΕΧΝΙΚΩΝ ΜΕΛΕΤΩΝ Α.Ε. otmate@otenet.gr
		Μαρίνα ΠΑΝΤΑΖΙΔΟΥ, Δρ. Πολιτικός Μηχανικός, Αναπληρώτρια Καθηγήτρια Ε.Μ.Π. mpanta@central.ntua.gr
Αναπληρωματικά Μέλη	:	Χρήστος ΣΤΡΑΤΑΚΟΣ, Πολιτικός Μηχανικός, ΝΑΜΑ Α.Ε. stratakos@namalab.gr
		Βάλια ΞΕΝΑΚΗ, Δρ. Πολιτικός Μηχανικός, ΕΔΑΦΟΜΗΧΑΝΙΚΗ Α.Ε. vxenaki@edafomichaniki.gr
Εκδότης	:	Χρήστος ΤΣΑΤΣΑΝΙΦΟΣ, Δρ. Πολιτικός Μηχανικός, ΠΑΝΓΑΙΑ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Ε.Π.Ε. editor@hssmge.gr, ctsatsanifos@pangaea.gr

ΕΕΕΕΓΜ

Τομέας Γεωτεχνικής
ΣΧΟΛΗ ΠΟΛΙΤΙΚΩΝ ΜΗΧΑΝΙΚΩΝ
ΕΘΝΙΚΟΥ ΜΕΤΣΟΒΙΟΥ ΠΟΛΥΤΕΧΝΕΙΟΥ
Πολυτεχνειούπολη Ζωγράφου
15780 ΖΩΓΡΑΦΟΥ

Τηλ. 210.7723434
Τοτ. 210.7723428
Ηλ-Δι. secretariat@hssmge.gr ,
geotech@central.ntua.gr
Ιστοσελίδα www.hssmge.org (υπό κατασκευή)

«ΤΑ ΝΕΑ ΤΗΣ ΕΕΕΕΓΜ» Εκδότης: Χρήστος Τσατσανίφος, τηλ. 210.6929484, τοτ. 210.6928137, ηλ-δι. ctsatsanifos@pangaea.gr, editor@hssmge.gr, info@pangaea.gr

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