

# Minutes for 29<sup>th</sup> ISSMGE TC304 Meeting (email meeting)

**Date: March 26-30, 2018**

**Time:** Meeting closes as of 5:00 pm (Taipei, UTC/GMT +8 hours), March 30 2018

## 1. Approval of the 28th TC304 minutes (Email meeting, Dec 11-15 2017)

Minutes were approved.

## 2. Survey on "Innovation Initiatives of ISSMGE" (available until April 30 2018)

<https://www.surveymonkey.com/r/R SX6HS2>

## 3. TC304 task forces & working groups

TC304 databases (304dB) [http://140.112.12.21/issmge/Database\\_2010.htm](http://140.112.12.21/issmge/Database_2010.htm)

- Multivariate soil/rock property databases (Yu Wang)
  - New multivariate rock database (ROCK/9/4069)
- Liquefaction databases (LiqChina) (Yanguo Zhou, Xiao-jun Li, Su Chen, Xiao-Ming Yuan, Long-Wei Chen, Lan-Min Wang, Lin Dong, Li-Hua Tang, Shuai Li, Guo-Jun Cai, Jie Zhang, Wen-Ping Gong & Chih-Sheng Ku)
  - Will have a team meeting in Mid-April to set up the standards/specifications for compiling the liquefaction case histories.
  - Will present the Version 1 database online (i.e., the examples of each sub-category open to all TC304 members for feedback) around the end of April 2018, and then gradually fill the data pool by the end of June 2018.
- 304dB activity reported in "TC Corner" in ISSMGE Bulletin (Vol12, Issue 1, Feb 2018)
  - <https://www.issmge.org/publications/issmge-bulletin/vol12-issue-1-feb-2018>
- 1-page powerpoint
  - TC304 members are encouraged to mention 304dB in conference presentations. A 1-page ppt file for 304dB can be downloaded here ([standard](#); [wide](#)).
- 304dB database server (Yu Wang)
  - Yu is working on developing a new webpage for the multivariate soil/rock property databases, which will allow a user to search the database and improve the efficiency of using and accessing the database. Yu is also exploring the possibility of hosting the databases in a Google server.
- Forum paper in ASCE Journal of Geotechnical & Geoenvironmental Engineering (Armin)
  - Armin has begun to draft the forum article for submission to JGGE.
- Usage report for 304dB: It is important to trace the actual usage of the TC304dB. Please list your works below if you have utilized 304dB and acknowledged the TC304 and the database owners in them.

Database	Work title	Acknowledge 304dB and database owners?
CLAY/10/7490	Ching, J. and Phoon, K.K. (2018). Constructing site-specific probabilistic transformation model by Bayesian machine learning. ASCE Journal of Engineering Mechanics (in review)	Will do during revision
A-CPT/232/2500m <sup>2</sup>	Ching, J., Phoon, K.K., Stuedlein, A.W., and Jaksa, M. (2018). Can the auto-correlation of soil be characterized by the scale of	304dB is acknowledged (database owner is co-author)

	fluctuation alone? Structural Safety (in review)	
SC-CPTU/25/78m <sup>2</sup>	Ching, J., Phoon, K.K., Stuedlein, A.W., and Jaksa, M. (2018). Can the auto-correlation of soil be characterized by the scale of fluctuation alone? ASCE Journal of Engineering Mechanics (in review)	304dB is acknowledged (database owner is co-author)
CLAY/10/7490	Sin-Chi Kuok and Ka-Veng Yuen (2018). Clay properties correlation prediction using broad learning. To be submitted to a special collection for the ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering (under preparation)	Will acknowledge.
A-CPT/232/2500m <sup>2</sup>	Yu Wang, Tengyuan Zhao, and KK Phoon (2018). Bootstrapping of random field correlation structure from multiple sets of incomplete measurement data, Structural Safety (in review)	304dB is acknowledged

#### Other task forces & working groups

- Machine Learning ((Dianqing Li, Zijun Cao, He- Qing Mu & Zhongqiang Liu):
  - ML reference list is ready and consists of four parts
    - [http://140.112.12.21/issmge/ML\\_ref.htm](http://140.112.12.21/issmge/ML_ref.htm)
      - PART I: NEED TO KNOW KNOWLEDGE (15 references)— Probability theory, information theory, decision theory, and introductory materials on machine learning
      - PART II: MACHINE LEARNING ALGORITHMS (167 references)— Supervised learning, semi-supervised learning, reinforcement learning, unsupervised learning and Bayesian machine learning
      - PART III: APPLICATIONS IN GEOTECHNICAL ENGINEERING (238 references)— Applications of artificial neural networks, support vector machine, clustering, feature learning (dimensionality reduction), outlier detection, and Bayesian machine learning. For each algorithm, references are categorized by problem nature.
      - PART IV: PERFORMANCE COMPARISON OF MACHINE LEARNING ALGORITHMS USING THE SAME DATASET (8 references)
    - PART III: APPLICATIONS IN GEOTECHNICAL ENGINEERING is open to TC304 members for updates. Please send updates to Zijun Cao ([zijuncao@whu.edu.cn](mailto:zijuncao@whu.edu.cn)) (download [update form](#))
- Wikipedia (Andy Leung)
- Nomination of the Suzanne Lacasse Lecturer in ISGSR 2019
  - Previous Suzanne Lacasse Lecturers  
[http://140.112.12.21/issmge/Suzanne\\_Lacasse\\_2010.htm](http://140.112.12.21/issmge/Suzanne_Lacasse_2010.htm)

#### 4. Activities in the past six months (conferences, short courses, and keynotes)

##### 3.1 Conferences

- 15th International Conference of the International Association for Computer Methods and Advances in Geomechanics (15 IACMAG), Oct 19-23 2017, Wuhan, China
  - Sessions on “Computational probabilistic geomechanics” (KK Phoon, DQ Li & M Beer) – 2 sessions with 9 presentations

- Invited lecture “Homogenization of strength and modulus in spatially variable soils” (KK Phoon & J Ching).
- International Symposium on Life-cycle Engineering and Sustainability of Infrastructure (ISLESI 2017), Nov 8-11 2017, Taipei, Taiwan
  - Keynote “Effect of strain softening on mobilized strength of spatially variable soil” (KK Phoon)
  - Keynote “Construction of site-specific probabilistic transformation model for geotechnical design” (J Ching)
- The 2<sup>nd</sup> National Young Researchers Symposium on Engineering Risk analysis & Management, Mar 30-31 2018, Wuhan, China (Chair: Dianqing)
- International Foundations Congress and Equipment Expo, March 5-10 2018, Orlando, Florida.
  - GI-RAM meeting (Vaughan)

### 3.2 Short courses

- Short course (2-days) on “Reliability and risk in geotechnical engineering practice”. Deltares Academy, Oct 23-24 2017, Delft, Netherlands (T. Schweckendiek & W. Kanning).
- Short course on “Finite Element Methods in Geotechnical Engineering”, Tongji Jiading Campus, January 6th 2018, Shanghai, China (Vaughan Griffiths)

### 3.3 Books/journals/special issues

- Chinese translation of Phoon, K. K. & Retief, J. V. (2016), Reliability of Geotechnical Structures in ISO2394 (CRC Press/Balkema) by D.Q. Li, X.S. Tang, Z.J., Cao: 李典庆、唐小松、曹子君. 2018. 基于 ISO2394 的岩土工程可靠度设计, China Water & Power Press (中国水利水电出版社).
- Special Collection of the ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems: Part A on “Probabilistic Site Characterization” (KK Phoon)
  - Adeyemi Emman Aladejare and Yu Wang: Sources of Uncertainty in Site Characterization and Their Impact on Geotechnical Reliability-Based Design,
  - Jianye Ching, Kok-Kwang Phoon, James L. Beck, and Yong Huang: Identifiability of Geotechnical Site-Specific Trend Functions
  - Anders Prästings, Johan Spross, Rasmus Müller, Stefan Larsson, William Bjureland, and Fredrik Johansson: Implementing the Extended Multivariate Approach in Design with Partial Factors for a Retaining Wall in Clay
  - Xiao-Hui Qi, Wan-Huan Zhou, and Ka-Veng Yuen: Detection of Stationary Markovian Zones in a Geologically Heterogeneous Area
  - Meng-Yao Shen, Zi-Jun Cao, Dian-Qing Li, and Yu Wang: Probabilistic Characterization of Site-Specific Inherent Variability of Undrained Shear Strength Using Both Indirect and Direct Measurements
  - Te Xiao, Li-Min Zhang, Xue-You Li, and Dian-Qing Li: Probabilistic Stratification Modeling in Geotechnical Site Characterization

### 3.4 Keynotes/invited lectures

- Invited lecture “Homogenization of strength and modulus in spatially variable soils” (KK Phoon & J Ching), 15th International Conference of the International Association for Computer Methods and Advances in Geomechanics (15 IACMAG), Oct 19-23 2017, Wuhan, China
- Keynote “Effect of strain softening on mobilized strength of spatially variable soil” (KK Phoon & Yutao Pan), International Symposium on Life-cycle Engineering and Sustainability of Infrastructure (ISLESI 2017), Nov 8-11 2017, Taipei, Taiwan
- Keynote “Construction of site-specific probabilistic transformation model for geotechnical design” (J Ching), International Symposium on Life-cycle Engineering and Sustainability of Infrastructure (ISLESI 2017), Nov 8-11 2017, Taipei, Taiwan

### 3.5 Awards

- Armin Stuedlein receives the 2017 ASTM Award for Outstanding Article on the Practice of Geotechnical Testing his paper “Development and Implementation of a High-Pressure, Double-Acting, Bi-Directional Loading Cell for Drilled Shafts,” co-authored with Yongkyu Choi, Min-Hee Lee, Moon Nam, and Tae-Hyung Kim.

## 5. Future activities

### 4.1 Conferences

- Major event in 2018: 6<sup>th</sup> International Symposium on Reliability Engineering and Risk Management (6ISRERM), May 31-June 1 2018, Singapore (chaired by KK) (KK Phoon)
  - <http://cee.nus.edu.sg/ISRERM/index.html>
  - Registration now opens.
  - The theme of this conference is resilience engineering. One objective is to discuss the role of reliability in robustness and resilience.
  - Special sessions organized by TC304:
    - Yu Wang and Jianye Ching “Geotechnical risk and reliability” (12 papers)
    - Dianqing Li and Dagang Lv “Meta-model based uncertainty quantification and reliability analysis” (6 papers)
    - Hongwei Huang and Bilal Ayyub “Resilience of geotechnical system and infrastructure” (3 papers)
    - Zijun Cao and He-Qing Mu “Geotechnical databases and data analysis” (8 papers)
    - LM Zhang and Jinhui Li “Landslide risk assessment and management” (6 papers)
  - Short course on “Statistical Estimation of Soil Properties” (KK Phoon & J Ching)
  - Keynote “Bayesian data mining for a generic geotechnical database” (J Ching & KK Phoon)
  - TC304 Forum on 304dB (Armin & Jianye): TC304 is sponsoring a panel discussion session to discuss the Opportunities and Drawbacks of publically-available subsurface databases and their role in improving the characterization of the spatial variability of soils. Please do attend the panel session if you can make it to Singapore for the conference.
  - A special session will be organized for the shortlisted papers for the best student paper award and the student scholarship. More details can be found at the conference website.
  - TC304 meeting will be held during 16:30 – 17:30 pm, June 1 2018

- The European Geoscience Union - General Assembly 2018 (EGU 2018), April 8-13 2018, Vienna, Austria
  - <https://egu2018.eu/home.html>
  - Multidisciplinary session titled “Geostatistical and statistical tools to perform the data fusion of large datasets in geo-engineering and environmental studies” (D. Di Curzio, A. Castrignanò, A. Micallef, S. Rusi, G. Vessia, R. Viscarra Rossel) (<http://meetingorganizer.copernicus.org/EGU2018/session/28382>).
  - Abstract submission is open up to 10th January 2018 at: [https://egu2018.eu/abstract\\_management/how\\_to\\_submit\\_an\\_abstract.html](https://egu2018.eu/abstract_management/how_to_submit_an_abstract.html)
  
- 5th China National symposium on Engineering Risk and Insurance, Aug 17-19 2018, Harbin Institute of Technology Harbin, China (Dagang LV & HW Huang)
  - Full paper submission due: April 30 2018
  - Aug 17-19 2018
  - Contact: [gcfxybx@163.com](mailto:gcfxybx@163.com)
  - TC304 student competition on “Geotechnical Data & Machine Learning” will be organized at this conference (Jie Zhang & J Ching)
    - Students will be asked to solve prediction/estimation problems based on 304dB.
    - The establishment of TC304 Student Contest Award is approved by members
    - TC309 (Machine Learning and Big Data in Geotechnics) will be fully supporting this event. Dr. Dongming Zhang from TC309 will assist Jie Zhang (Zhongqiang)
    - Arjan suggests the results of this event can be shared among TC304 members. Jianye agrees.
  
- International Symposium for Geotechnical Safety & Risk (ISGSR 2019), Dec 11-13 2019, Taipei, Taiwan (J Ching)
  - <http://www.isgsr2019.org/>
  - Call for abstract: June 1, 2018
  - Abstract due: Aug 31, 2018
  - Wilson Tang & Suzanne Lacasse Lectures and 4 keynotes
  - 2 mini-symposiums, 16 sessions & 3 short courses
    - TC309/304 mini-symposium on Machine Learning and Big Data for Geotechnics
    - Mini-symposium on Performance-based Design Codes and Practice honoring Prof. Yusuke Honjo (Makoto Suzuki and Masahiro Shirato).
    - Advances in geotechnical reliability-based design (Zijun Cao & Dianqing Li)
    - Bayesian method for processing geotechnical data (Shadi Najjar)
    - Bayesian updating: Formalizing the observational method (Iason Papaioannou, Johan Spross & Daniel Straub)
    - Dams, levees and flood risk (Timo Schweckendiek)
    - Effect of spatial variability on seismic performance of soil and rock and associated reliability (Armin W. Stuedlein and Taeho Bong)
    - Engineering risk sensing by monitoring and inspection (Hongwei Huang & Shinichi Akutagawa)
    - Inverse analysis in geotechnical engineering (Shin-ichi Nishimura)
    - Landslide risk assessment and management (Limin Zhang)
    - Modelling spatial variability in geotechnical engineering (Jinsong Huang, D.V. Griffiths)

- Numerical techniques for integrating the spatial variability of soil and groundwater parameters into designing and environmental management (Giovanna Vessia, Diego Di Curzio & Wojciech Pula)
  - Probabilistic seismic hazard assessment and engineering seismology (JP Wang)
  - Probabilistic site characterization (Yu Wang & Zijun Cao)
  - Risk assessment of rainfall-induced geo-hazards (Lulu Zhang & Hong-Xing Chen)
  - Robust geotechnical design in the face of uncertainty (Wenping Gong, Lei Wang, Mengfeng Shen)
  - Statistics for soil & rock properties (KK Phoon)
  - Uncertainty & reliability analysis in rock engineering (Rafael Jimenez)
- 16th Asian Regional Conference (16ARC) on Soil Mechanics and Geotechnical Engineering, Oct 14-18 2019, Taipei, Taiwan (Der-Wen Chang)
  - <http://www.16arc.org>
  - TC304 session on “Geotechnical risk/reliability and data analysis” (JP Wang & J Ching)
    - Abstract due: March 31 2018
  - Short course (KK Phoon & J Ching)
  - Keynote (J Ching & KK Phoon)
- The 17th European Conference on Soil Mechanics and Geotechnical Engineering (17 ECSMGE), Sept 1-6 2019, Reykjavik, Iceland
  - <http://www.ecsmge-2019.com/>
  - Abstract due: May 30 2018
- 13<sup>th</sup> International Conference on Applications of Statistics and Probability in Civil Engineering (ICASP13), May 26-30 2019, Seoul, Korea, 2019 (Chair: Junho Song)
  - <https://www.icasp13.snu.ac.kr/>
  - TC304 session on “Development and Application of Probabilistic Methods in Geotechnical Engineering” (Yu, Jie, Jianye)
    - Abstract due: April 30 2018
- 7<sup>th</sup> Asian-Pacific Symposium on Structural Reliability and its Applications (APSSRA7), Tokyo, October 4-7th, 2020, The University of Tokyo
- 5<sup>th</sup> Geotechnical Earthquake Engineering and Soil Dynamics Conference, Austin, Texas, USA, 10-13 June 2019 (Chair: Adrian)
  - Adrian and Ellen Rathje will organize a session related to probabilistic assessment of seismic hazards and risk assessment
- 2018 European Geosciences Union General Assembly, Vienna, Austria, 8-13 April 2018
  - Giovanna and co-conveners will organize a session on "Geostatistical and statistical tools to perform the data fusion of large datasets in geo-engineering and environmental studies"

#### 4.2 Short courses

- Short course on “Statistical Estimation of Soil Properties”, 6<sup>th</sup> International Symposium on Reliability Engineering and Risk Management (6ISRERM), June 1 2018, Singapore (KK Phoon & J Ching)

- Short course in 16th Asian Regional Conference (16ARC) on Soil Mechanics and Geotechnical Engineering, Oct 14 or Oct 15 2019, Taipei, Taiwan (KK Phoon & J Ching)
- Short course on “Quantitative Risk Assessment in Geotechnical Engineering”, New Zealand Geotechnical Society (NZGS), May 28th 2018, Wellington, New Zealand (Vaughan Griffiths)
- Short course on “Quantitative Risk Assessment in Geotechnical Engineering”, New Zealand Geotechnical Society (NZGS), June 5th 2018, Christchurch, New Zealand (Vaughan Griffiths)
- Short course on “Finite Element Methods in Geotechnical Engineering”, Escuela Colombiana de Ingeniería Julio Garavito, October 12th 2018, Bogota, Colombia (Vaughan Griffiths)
- Short course on “Risk Assessment in Geotechnical Engineering”, Escuela Colombiana de Ingeniería Julio Garavito, October 13th 2018, Bogota, Colombia (Vaughan Griffiths)

#### **4.3 Books/journals/special issues**

- Special Issue in Georisk on “Recent Developments of Performance-based Design Codes and Practice” honoring Prof Yusuke Honjo (Makoto Suzuki and Masahiro Shirato).
  - Members who are interested to contribute papers can email Makoto directly ([makoto.suzuki@p.chibakoudai.jp](mailto:makoto.suzuki@p.chibakoudai.jp))
- Special issue in Biosystems Engineering on "Computational Tools to Support Soil Management Decisions" (Editors: Vessia G., Falconer R., Zimmermann B. & Tarquis A. M.)
- Georisk review paper for Machine Learning (Kelvin Yuen & He-Qing Mu), expected to be submitted to Georisk in late May 2018.
- Special Collection of the ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems: Part A on “Bayesian Learning Methods for Geotechnical Data” (Kelvin Yuen, J Ching & KK Phoon)
  - Confirmation of authors and title: April 15 2018

#### **4.4 Keynotes/invited lectures**

- Keynote “Bayesian data mining for a generic geotechnical database”, 6<sup>th</sup> International Symposium on Reliability Engineering and Risk Management (6ISRERM), May 31-June 1 2018, Singapore (J Ching & KK Phoon)
- Keynote, 16th Asian Regional Conference (16ARC) on Soil Mechanics and Geotechnical Engineering, Oct 14-18 2019, Taipei, Taiwan (J Ching & KK Phoon)

### **6. Other businesses**