THE GOOD, THE BAD, AND THE UGLY

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In an era where data is recognized as the "new oil", it makes sense for us to lean towards decision making strategies that are more responsive to data, particularly if we have zettabytes coming our way. In fact, we already have a lot of data, but the vast majority is shelved after a project is completed ("dark data"). It does not make sense to reduce one zettabyte to a few bytes describing a single cautious value. It does not make sense to expect big data to be precise and to fit a particular favourite physical model as demanded by the classical deterministic world view (so-called "good" data). This lecture advocates the position that there is value in data of any kind (good or not so good quality, or right or wrong fit to a physical model – we can call this "ugly data") and the challenge is for the new generation of researchers to uncover this value by hearing what data have to say for themselves, be it using probabilistic, machine learning, or other data-driven methods, and to re-imagine the role of the geotechnical engineer in an immersive environment likely to be imbued by machine intelligence. Perhaps for the first time, geotechnical engineers are getting re-acquainted with data and are beginning to see value beyond its conventional roles as inputs for physical models, measured responses from load tests for design checks, or monitoring information for the observational approach. In the speaker's opinion, we are at the threshold of an exciting future where digital and physical realities merge. We just need to transform decision making strategies tailored to a past data-poor environment to work with this new data-rich cyber-physical reality.

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Kok-Kwang Phoon is Distinguished Professor and Vice Provost (Academic Personnel), National University of Singapore. He obtained his BEng and MEng from the National University of Singapore and his PhD from Cornell University. He is a Professional Engineer in Singapore and past President of the Geotechnical Society of Singapore. Prof Phoon is particularly interested in developing statistical and other data-driven methods to support decision making in geotechnical engineering. He is the lead editor of 3 books: Reliability of Geotechnical Structures in ISO2394 (CRC Press/Balkema, 2016), Risk and Reliability in Geotechnical Engineering (CRC Press, 2015), and Reliability-based Design in Geotechnical Engineering (Spon Press, 2008). He was bestowed with numerous research awards, including the ASCE Norman Medal in 2005, the John Booker Medal in 2014, and the Humboldt Research Award in 2017. He is the Founding Editor of Georisk and advisory board member for the WEF Global Risks Report. He was elected as a Fellow of the Academy of Engineering Singapore in 2012.

Guests are welcome!

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