

## Keynote

### Global, regional, or municipal database? Which is better?

#### Biography



Dr. Ching is Distinguished Professor in the Dept. of Civil Engineering at National Taiwan University. He obtained his PhD degree in 2002 in University of California at Berkeley. His main research interests are geotechnical risk & reliability, random fields & spatial variability, probabilistic site characterization & geotechnical data analytics. He is Chair of TC304 (risk) in ISSMGE and Chair of Geotechnical Safety Network (GEOSNet). He is Managing Editor of Georisk, Associate Editor of Canadian Geotechnical Journal, and Editorial Board Member of Structural Safety. Dr. Ching is the recipient of the Outstanding Research Award (2011, 2014) and the Wu-Da-Yu Award (2009) from the Ministry of Science and Technology of Taiwan. He is now the Convener of Civil & Hydraulic Engineering Program of the Ministry of Science and Technology of Taiwan.

#### Abstract

It is well known that a transformation model constructed based on global data usually has large transformation uncertainty. In principle, a site-specific transformation model is desirable, but such a model may have large statistical uncertainty if site-specific data are sparse. Our recent works have shown that it is possible to construct a quasi-site-specific transformation model with relatively small uncertainty by incorporating the prior cross-correlation information in the database, if a suitable probabilistic model (such as the hierarchical Bayesian model recently developed by Ching et al. 2021) is adopted to capture the prior cross-correlation behaviors in the database. There is a question of what kind of database (global, regional, or municipal) can reduce the uncertainty in a more effective way. The purpose of this presentation is to address this question. To investigate this, a global clay database, a regional (Scandinavia) clay database, and a municipal (Shanghai) clay database are adopted to assist the construction of the quasi-site-specific transformation models for a Finland site and a Shanghai site. The uncertainties of the resulting quasi-site-specific transformation models will be compared. The database that results in a smaller uncertainty can be considered as a better database. Some insights may be obtained from the analysis results, and some discussions will be given.