

Department of Civil Engineering and Engineering Mechanics  
Columbia University

2016 Dongju Lee Memorial Lecture

Geotechnical Model Testing with 3D Printing: A Curved Soil Retaining Wall



Jui Pin Wang

Assistant Professor, Department of Civil and Environmental Engineering  
Hong Kong University of Science and Technology

Date: Tuesday, July 26

Time: 11:00AM – 12:00PM

Location: 750 Schapiro CEPSR (Costa Engineering Commons)

Curved or arched geotechnical structures are commonly used in civil engineering for increasing the stability/capacity and/or for aesthetic purposes. In this presentation, model testing conducted on the curved soil retaining wall will be presented. The construction was motivated and assisted with a relatively new material called porcupine blocks in a unique, curved shape. Another highlight of the study is that we used 3D printing for the 1:10 model preparations, fabricating small porcupine blocks more “easily” than conventional approaches. The test result shows that the curved wall would have a better performance than conventional (straight) walls, mainly because of the redistribution of earth pressure that mobilized the resulting force to a lower section of the curved wall.

**Dr. J.P. Wang** received his Ph.D. from Columbia University in 2007. After that, he worked in an engineering consultant firm in Pittsburgh for two years, mainly responsible for probabilistic seismic hazard analysis of nuclear power plants. In 2010, he joined the Department of Civil and Environmental Engineering at Hong Kong University of Science and Technology. His recent research includes the developments of joint-probability models using the copula theorem, and the applications of 3D printing to geotechnical model testing. He has published around 40 journal papers in the last 10 years, including winning the Best Paper Award from the journal of *Geotextiles and Geomembranes*.

Host: Prof. Hoe Ling

**The Dongju Lee Memorial Lecture** was established with a generous contribution from the Lee family. We would like to express our gratitude to DJ’s father, Prof. Yong-won Lee (who is currently the President of Chinju National University of Education, Korea), for his support in establishing the Lecture. DJ, as Dongju preferred to be called, was a student at the Department of Civil Engineering and Engineering Mechanics, where he obtained the MS degree in February 2002 and the Professional degree in February 2003. He completed all course requirements for the PhD in the field of Geotechnical Engineering.