



DEPARTMENT OF CIVIL ENGINEERING

DISTINGUISHED PUBLIC LECTURE (ONLINE)

**An Overview of Method of Fundamental Solutions:
Solvability, Convergence, and Applications**

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Dean Emeritus of School of Engineering, University of Mississippi

Date: August 12, 2020 (Wednesday)

Time: 7:00 p.m. (Hong Kong Time)

6:00 a.m. (USA Central Time)

Zoom: <https://hku.zoom.us/j/98561307284?pwd=TW9UY0cxQUVFemd5WmZYMHVUbXlwdz09>
(Meeting ID: 985 6130 7284, Password: 399531)**Abstract**

The Method of Fundamental Solutions (MFS) has been widely used in the numerical solution of linear partial differential equations for which fundamental solutions exist. Applications include elastostatics, thermoelasticity, poroelasticity, acoustics, elastodynamics, poroelastodynamics, electromagnetics, magnetoencephalography, Stokes flow, and ill-posed and inverse problems. This talk discusses a few issues associated with the method, such as solvability, degenerate scale, and spurious frequency, and offers remedies. It also clarifies the difference in error convergence between the harmonic and nonharmonic boundary value problems. Optimization is suggested to find the best solution without mesh refinement.

About the Speaker

Alexander Cheng is Dean Emeritus of School of Engineering, and previously served as Chair of Department of Civil Engineering, at the University of Mississippi. He also taught at Cornell University, Columbia University, and University of Delaware, prior to joining UM. He obtained his Ph.D. from Cornell University, M.S. from University of Missouri, and B.S. from National Taiwan University. His research covers groundwater flow and transport, saltwater intrusion, boundary element method, radial basis function collocation method, poromechanics, and nanomechanics. He has authored and coauthored 5 books, including *Modeling Groundwater Flow and Contaminant Transport*, 2010, and *Poroelasticity*, 2016, both by Springer, and more than 180 journal articles. He previously served as President of Engineering Mechanics Institute, American Society of Civil Engineers, and Vice President of Academic Affairs, American Institute of Hydrology. He is the Editor-in-Chief of *Engineering Analysis with Boundary Elements* (Elsevier), Associate Editor of *Transport in Porous Media* (Springer), International Associate Editor of *Journal of Mechanics* (Cambridge), and was formerly Associate Editor of *Journal of Engineering Mechanics* (ASCE) and *Journal of Nanomechanics and Micromechanics* (ASCE). He was the recipient of the George Green Medal, the Maurice A. Biot Medal, the Walter L. Huber Civil Engineering Research Prize of ASCE, and the Basic Research Award of U.S. National Committee for Rock Mechanics.

FREE ADMISSION - ALL ARE WELCOME

Registration is required only for participants who require attendance certificate:https://hkuems1.hku.hk/hkuems/ec_hdetai.aspx?guest=Y&ucid=70536**An electronic certificate of attendance will be issued to registered participants after the public lecture.**