香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

土木及環境工程學系
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

SEMINAR

COUPLED PERIDYNAMIC MODELING OF FLUID - DRIVEN FRACTURES IN SOLIDS

Speaker

Prof. Fan ZHU

Kyoto University, Japan

Abstract

Fluid-driven fracturing in solids is involved in many industrial operations and natural processes, such as hydraulic fracking in the petroleum industry, carbon sequestration, and geothermal systems. The intricate interplays between crack growth, fluid flow, and solid deformation pose grand challenges in the numerical modeling of such processes. The particle-based peridynamics theory, serving as a non-local reformulation of classical continuum mechanics, has been developed for modeling the fracturing of solids. In this presentation, Dr. Zhu will share recent research efforts on the development of a coupled total- and semi-Lagrangian peridynamics method for modeling fluid-driven fracturing problems with reference to various engineering applications.

Biography

Dr. Fan Zhu is an Associate Professor in the Department of Urban Management at Kyoto University. Dr. Zhu received his PhD from the Hong Kong University of Science and Technology as an awardee of the Hong Kong PhD Fellowship, and his master's and B.Eng. degrees from University of Delaware in the USA and Huazhong University of Science and Technology, respectively. Dr. Zhu also has over five years' industrial experience in geotechnical and geoenvironmental engineering consulting firms. Dr. Zhu's research expertise is in the study of micro- to macro-scale behaviors of granular materials and developing novel computational methods for multiphysics modeling of material damage.

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HKUST

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