

## Structural Engineering Seminar Series

CEE595S

### *Isogeometric Multi-phase Fluid-Structure Interaction*

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**Abstract:** A computational multi-phase fluid-structure interaction (FSI) framework we developed will be presented. The core computational technology, which includes Isogeometric Analysis (IGA) and a moving domain multi-phase FSI formulation, will be reviewed. The multi-phase FSI framework was used to simulate a number of large-scale engineering structures, including aquatic sports equipment, tidal turbines and floating offshore wind turbines and was validated using experimental results. The advanced simulations provide in-depth understandings of the dynamic response of these structures in complicated environment, which will ultimately aid the design and optimization of these structures. The proposed multi-phase FSI framework is a powerful tool for the design and analysis of critical infrastructure systems and shows great potential for structural engineering applications. In the end of presentation, an overall review of the current and future research directions in the group will be also shown.

**Bio:** Jinhui Yan is currently an assistant professor at department of civil and environmental engineering at University of Illinois Urbana-Champaign. Before joining Illinois, he was a postdoc researcher at Northwestern University for two years. He obtained his B.S. from Wuhan University, M.S. from Peking University, and Ph.D. in structural engineering from UCSD. His Ph.D. dissertation, which was nominated for UCSD Chancellor Dissertation Medal, focused on developing computational free surface fluid-structure interaction framework with applications to large-scale offshore structural systems. He received many awards, such as Charles Lee Powell Fellowship from UCSD, Presidential Fellowship from Peking University, National Scholarship, and Outstanding Award for Ph.D. Student Abroad from the Chinese government. He delivered several invited keynote talks in World Congress for Computational Mechanics, U.S. National Congress for Computational Mechanics and ASCE Engineering Mechanics Institute Conference. He is a reviewer for many top international journals in his research field and an external reviewer for the Research Grants Council of Hong Kong.

**Monday, September 17th, 4:00-5:00pm**  
**1310 Yeh Student Center**