

Title

A new modeling scheme for multiphysics systems and structural optimization

Abstract

In this presentation, we will explore recent advancements in the theoretical, experimental, and computational modeling of multiphysics systems, encompassing fluid-structure interaction, fluid-thermal dynamics, and particle-fluid interaction. The continual evolution of coupled computational methods seeks to address the demands of designers, operators, and engineers, aiming to enhance predictive accuracy, precision, and the ability to assess intricate operational scenarios. As a result, multiphysics solvers are becoming increasingly sophisticated and indispensable.

To effectively analyze and optimize these coupled multiphysics problems, systems are often decomposed into individual physical components, utilizing both monolithic and segregated approaches. Structural optimization, in particular, necessitates substantial refinement of existing algorithms and methodologies. This talk will delve into our recent research progress on multiphysics challenges, highlighting not only novel computational theories but also collaborative experimental work with industry partners. The presentation will conclude with an open dialogue addressing remaining challenges and potential future research directions.

Biography

Professor GilHo Yoon is a faculty member in the Department of Mechanical Engineering at Hanyang University. His research team specializes in multiphysics analysis and design optimization. Dr. Yoon holds a BS, MS, and PhD in Mechanical Engineering from Seoul National University. Prior to joining the faculty at Hanyang University, he served as a professor at the Technical University of Denmark (DTU) and Kyungpook National University. He is an active member of several professional organizations, including the Korean Society of Mechanical Engineers (KSME), the Prognostics and Health Management Society of Korea (PHM Korea), the Computational Structural Engineering Institute of Korea (COSEIK), and the Korean Society for Computational Mechanics (KSCM).

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