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Online, Zoom Meeting ID: <https://hawaii.zoom.us/my/frankiezhu>

Department of Mechanical Engineering Seminar Series
Jointly presented with the UH Aerospace Engineering Seminar Series

Multi-Fidelity, Topology Optimization via Two-Point Topological Derivative

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Abstract

Handling multidisciplinary responses during structural topology optimization is important to a field that has grown rapidly in the last decade, spurred by additive manufacturing and 3D printing. The cellular division method for topological design is more general than conventional optimality criterion methods used most often in industrial structural topology design; however, it is a discrete approach that is daunting due to the curse of dimensionality. The innovative approach presented here formulates the design problem as a more tractable gradient-based one that exploits a new two-point topological derivative. Results are presented for benchmark test cases using the multi-fidelity approach using two-point topological derivatives to drive cellular development.

About the speaker

Marcelo Kobayashi is Professor of Mechanical Engineering at the University of Hawai'i at Manoa. Professor Kobayashi received his Ph.D. in Mechanical Engineering (1994) and his Ph.D. in Mathematics (2003) from the Technical University of Lisbon. He joined the Department of Mechanical Engineering in 2003, and was Chair from 2017 to 2019. His current research focus is on topology optimization as part of multidisciplinary design optimization. In this research, Dr. Kobayashi pioneered the use of evolutionary developmental principles from biology in the design of aerospace structures. His research has been funded by NSF, AFOSR, AFRL, ONR and NIH.

