



Approaching Engineering Challenges

with a Design Optimization Perspective

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ABSTRACT

If you spend enough time teaching engineering concepts to undergraduate students while researching new design optimization algorithms, you begin to think about all problems as optimization problems. Thinking about engineering challenges in this way can lead to new engineering insight while simultaneously producing more effective results, but it does require the use of a unique set of skills and a willingness to meet unexpected challenges in novel ways. Dr. Hamel will present some basic design optimization concepts that he has found to be repeatedly useful in his work, and will then briefly present a few case studies from recent research efforts and senior design projects that highlight how using “optimization thinking” is an interesting and effective way to approach engineering problems across a wide spectrum of applications.

SPEAKER BIO

Dr. Josh Hamel is a dedicated educator and researcher with a varied background in multiple mechanical engineering disciplines. Dr. Hamel is keenly interested in the engineering design process, and his current research efforts are focused on the

optimization of system using surrogate approximation, and the integration of design optimization and additive manufacturing. He has taught courses in engineering design, mechanics, engineering computation, thermodynamics, fluid mechanics, experimental data analysis and flight stability. Dr. Hamel received his Ph.D. in Mechanical Engineering from the University of Maryland, College Park, his M.S. in Mechanical Engineering from the University of Michigan, Ann Arbor, and his B.S. in Mechanical Engineering from the U.S. Naval Academy in Annapolis, Maryland. Dr. Hamel is a licensed professional engineer (PE) and is also a veteran of the U.S. Navy where he served as an officer and a naval aviator for 10 years.