

Giga scale topology optimization: from material design to full assemblies

Niels Aage

Technical University of Denmark

Department of Mechanical Engineering

Kongens Lyngby, Denmark

Abstract

This talk will address some recent developments within the field of topology optimization, e.g. the engineering of determining optimal material distributions. The main focus concerns the current state-of-the-art, which is that large structural systems has until now been dealing mainly with the design of individual parts - and not with complete assemblies or structures. In this talk the possibilities, when circumventing this limitation by supercomputing are addressed, and examples of giga-voxel structural optimization is shown. The talk includes highlights on extreme material design, designing for additive manufacturing, interactive and real-time structural optimization, non-linear multi-physics and the design of a full scale wing structure.