Structural Optimization, the past, present and future

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Abstract
With the fast development of computational mechanics and the capacity as well as the speed of modern computers, simulation-based structural optimization has become an indispensable tool in the design process of competitive products. In China, the national goal for a transition from the biggest manufacturing country to the strongest one provides unprecedented impetus to the research and application of structural optimization in many industrial field. This paper reviews some significant progress of structural optimization, including optimization methodology, design concept and numerical algorithms made in the past decades. In particular, structural topology optimization and surrogate model-based optimization approach together with metaheuristic algorithms is discussed in more detail. Potential research topics are discussed in line with the state-of the art discussion in the recent 12th world congress of structural and multidisciplinary optimization (WCSMO12), 5-9 June 2017, in Braunschweig, Germany. The entire literatures of the field are not covered due to the time limitation of the presentation.