

Design optimization in computational mechanics

Scientific area: Industrial Applications and Challenges

Computational modeling and simulation are common tools in modern engineering and industrial design practice. Digital prototyping predicts the performance of the new product in different conditions and helps engineers to better understand the special aspects of the proposed design. At the same time, numerical optimization methods assist the design process in improving future products and processes. Pioneering fields in applying computational optimization methods to mechanical problems include shape, size, and topology optimization and inverse problems. Due to the rising industrial interest, research is actively carried out in the disciplines of applied mathematics and computational mechanics. As a result, existing methods are constantly developed and improved, allowing them to solve more complex optimization problems. At the same time, there are new opportunities emerging, driven by practical applications and challenges. The most recent examples are the fields of additive manufacturing, material design, and data-driven approaches, and others. The goal of this minisymposium is to bring together young researchers from the distinctive design optimization disciplines, exchange ideas and results, spark new collaborations, and explore future research opportunities.

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