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Optimal Synthesis of Compliant Mechanisms Using Subdivision and Commercial FEA

By -

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.The field of distributed-compliance mechanisms has seen significant work in developing suitable topology optimization tools for their design. These optimal design tools have grown out of the techniques of structural optimization. This paper will build on the previous work in topology optimization and compliant mechanism design by proposing an alternative design space parameterization through control points and adding another step to the process, that of subdivision. The control points allow a specific design to be represented as a solid model during the optimization process. The process of subdivision creates an additional number of control points that help smooth the surface (for example a $C(\sup 2)$ continuous surface depending on the method of subdivision chosen) creating a manufacturable design free of some traditional numerical instabilities. Note that these additional control points do not add to the number of design parameters. This alternative parameterization and description as a solid model effectively and completely separates the design variables from the analysis variables during the optimization procedure. The motivation behind this work is to create an automated design tool from task definition...



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