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opology optimization in structural mechanics

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Optimization of structural topology, called briefly: topology optimization, is a relatively new branch of structural optimization. Its aim is to create optimal structures, instead of correcting the dimensions or changing the shapes of initial designs. For being able to create the structure, one should have a possibility to handle the members of zero stiffness or admit the material of singular constitutive properties, i.e. void. In the present paper, four fundamental problems of topology optimization are discussed: Michell's structures, two-material layout problem in light of the relaxation by homogenization theory, optimal shape design and the free material design. Their features are disclosed by presenting results for selected problems concerning the same feasible domain, boundary conditions and applied loading. This discussion provides a short introduction into current topics of topology optimization.

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