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About two problems in Structural Optimization that can be approximately solved using Homogenization*

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Abstract

The Theory of Homogenization addresses the problem of coupling different length scales, which pervades many fields like optimal design, materials science, climatology, etc.

In this talk we are concerned with two problems in structural optimization: reinforcement distribution in non slender reinforced concrete elements and controlling stress concentration. The idea is to use homogenization to relax the associated optimization problems, therefore considering generalized designs that admit for the use of composite materials. However, these designs are generally too expensive, then we penalize the use of composites to come back to classical designs. The optimization problems are approximately solved using FEM to solve the state and adjoint problems and a steepest descent algorithm.

References

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