

Publication

Approximating solution spaces as a product of polygons

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Solution spaces are regions of good designs in a potentially high-dimensional design space. Good designs satisfy by definition all requirements that are imposed on them as mathematical constraints. In previous work, the complete solution space was approximated by a hyper-rectangle, i.e., the Cartesian product of permissible intervals for design variables. These intervals serve as independent target regions for distributed and separated design work. For a better approximation, i.e., a larger resulting solution space, this article proposes to compute the Cartesian product of two-dimensional regions, so-called 2d-spaces, that are enclosed by polygons. 2d-spaces serve as target regions for pairs of variables and are independent of other 2d-spaces. A numerical algorithm for non-linear problems is presented that is based on iterative Monte Carlo sampling.

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