JOHANNES KEPLER UNIVERSITY LINZ

Johannes Kepler University Linz
Institute of Numerical Mathematics
Univ.-Prof. Dr. Herbert Egger

INSTITUTE OF NUMERICAL MATHEMATICS

Talk announcement

Michael Winkler
(RICAM)

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A generalized homotopy approach in multiobjective topology optimization

The Pareto curve of a multicriteria optimization problem can be interpreted as a zero curve of the homotopy map which is derived from the scalarization of the underlying vector-valued objective. Numerically tracing the homotopy curve thus allows for an efficient computation of candidates for Pareto optimal points. The conventional approach however fails in connecting the sections of different curvature of a nonconvex Pareto curve. Generalizing the homotopy map and introducing a (varying) local parametrization vector enables tracing the curve past inflection points. In the realm of density based topology optimization, we employ a sequential approach involving a relaxation strategy to facilitate topological changes of the design along the Pareto curve. We present numerical results for a benchmark design optimization problem related to structural mechanics.