Talk announcement

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Finite element analysis for topological derivatives of optimization problems subject to a linear PDE constraint

The topological derivative describes the variation of a shape functional subject to infinitesimal topological perturbation. We start with the analytical derivation of the topological derivative of a certain class of optimization problems subject to a linear PDE constraint by a Lagrangian approach. In this context, a transmission problem has to be solved on an unbounded domain. This equation is solved numerically by performing FEM on a truncated domain. We investigate the error of the discrete topological derivative subject to the truncation parameter, the mesh size of the transmission problem and the mesh size used to approximate the original PDE.