On solution of contact shape optimization problem by proximal bundle method

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Abstract: From the mathematical point of view, the contact shape optimization is a problem of nonlinear (usually nonsmooth) optimization with a specific structure which can be exploited in its solution. In this presentation, we show how to overcome the difficulties related to the nonsmooth cost function by using the proximal bundle methods. We describe all steps of the solution, including linearization, construction of a descent direction, line search, stopping criterion, etc. To illustrate the performance of the presented algorithm, we solve a shape optimization problem associated with the discretized two-dimensional contact problem with Coulomb's friction.

Keywords: nonsmooth optimization, Clarke calculus, proximal bundle method, shape optimization.