Adaptive Optimal Control of Contact Problems

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In this talk, we discuss optimal control of contact problems, for instance obstacle or Signorini problems. To employ gradient based algorithms the underlying problem is regularized and then discretized by finite elements. An approach to estimate the arising regularization, discretization and numerical errors based on the dual weighted residual (DWR) method is presented. A similar idea was recently introduced by Meyer, Rademacher and Wollner for the obstacle problem. However, instead of estimating the different errors by separate approaches, the DWR method is directly applied to estimate the total error. The resulting terms of the estimate can be assigned to the different error sources. Finally, we utilize the estimator in an adaptive refinement strategy balancing regularization and discretization errors. Numerical results substantiate the theoretical findings.

References:

[1] Christian Meyer, Andreas Rademacher and Winnifried Wollner: Ädaptive optimal control of the obstacle problem", SIAM Journal of Scientific Computing, 37(2). P. A918–A945, 2015

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