

# A Trust-Region-Method for the Optimal Control of Variational Inequalities

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**Abstract:** This talk is concerned with an optimal control problem governed by an elliptic variational inequality (VI) of the second kind involving the  $L^1$ -norm. The solution map associated with such a VI is in general not Gâteaux-differentiable so that the optimization problem under consideration is non-smooth and, consequently, classical derivative-based optimization algorithms cannot be used. The VI is discretized by means of finite elements and we apply a mass lumping technique for the discretization of the  $L^1$ -norm. We present a new non-smooth trust-region algorithm for the solution of the discretized problem. It will be shown that accumulation points of the sequence of iterates are Clarke stationary in the sense that zero is an element of the Clarke subdifferential of the reduced objective. Numerical experiments demonstrate the efficiency of our algorithm.

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