Optimal Control of a Simplified Signorini Problem

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In the context of optimal control we consider a simplified Signorini problem, an elliptic variational inequality of first kind with unilateral constraints on the boundary. The state is discretized using linear finite elements while a variational discretization is applied to the control. We derive a priori error estimates for the control and state based on strong stationarity and a quadratic growth condition. The convergence rates depend on $H1$ and $L2$ error estimates of the simplified Signorini problem.

Furthermore, we also discuss a non-standard regularization in the optimal control problem.