L1-optimal controls for driftless affine control systems

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Résumé

In this paper, we search for control of minimal L1-norm steering the solution of a non-linear driftless affine control system from an initial state to a prescribed target state in a prescribed time T> 0. This study indicates that minimal L1-norm controls are not unique and in particular, among others, there always exist purely impulsive controls and controls in L1. As an outcome of this result, we can also say that there are controls of minimal L1-norm which are sparse in the sense that their support is of null Lebesgue measure. To tackle this problem, we use the graph completion method introduced by Bressan and Rampazzo in 1988.

Mots-Clés: Optimal control, sparse control, nonlinear system

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