
Sparsity and L1-optimal control for linear systems

Pierre Cavaré^{*1}, Marc Jungers², and Jérôme Lohéac

¹Centre de Recherche en Automatique de Nancy – Université de Lorraine - CRAN CNRS UMR 7039 –
France

²Centre de Recherche en Automatique de Nancy (CRAN) – Université de Lorraine, CNRS : UMR7039
– France

Résumé

In this talk, we take an interest in maximum hands-off controls (i.e. feasible controls whose support is of minimal Lebesgue measure) for linear time-invariant systems when controls belong to the set of Radon measures. In particular, we prove that there always exists a feasible impulsive control that we can approach with a sequence of feasible controls in L1. This problem leads us to the minimization problem of the L1-norm and, once again, we show the existence of a "no gap" impulsive solution. In this two problems, we can also bound the number of impulses of the impulsive solutions thanks to the rank of the Kalman matrix of the LTI system.

Mots-Clés: Optimal Control, Sparsity, Control theory

*Intervenant