

Optimal design of sensors and actuators

Enrique Zuazua

Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

email: enrique.zuazua@fau.de

Abstract

In this lecture we shall present some recent results in collaboration with B. Geshkovski (MIT) on the design of optimal sensors and actuators for control systems. We shall mainly focus in the finite-dimensional case, using the Brunovsky normal form. This allows to reformulate the problem in a purely matricial context, which permits rewriting the problem as a minimization problem of the norm of the inverse of a change of basis matrix, and allows us to stipulate the existence of minimizers, as well as non-uniqueness, due to an invariance of the cost with respect to orthogonal transformations. We will present several numerical experiments to both visualize these artifacts and also point out towards further directions and open problems, in particular in the context of PDE infinite-dimensional models.

...