Complexity of control-affine motion planning

Frédéric Jean
ENSTA ParisTech
frederic.jean@ensta-paristech.fr

joint work with *Dario Prandi, LSIS Université de Toulon*

Abstract

In this talk we study the complexity of the motion planning problem for control-affine systems. Such complexities are already defined and rather well-understood in the particular case of nonholonomic systems. Our aim is to generalize these notions and results to systems with a drift. Accordingly, we present various definitions of complexity as functions of the curve that is approximated and of the precision of the approximation. These functions appear as value functions of some optimal control problems with state constraints. Note that due to the lack of time-rescaling invariance of the control-affine systems, we consider geometric and parameterized curves separately. Then, we give some asymptotic estimates for these quantities.

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