

DIFTA

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SB2/734, 14:15–15:00

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Nearly Optimal Feedback Controls

Abstract: In this seminar, I will present few recent results about the existence of feedback controls for a system

$$\dot{x} = f(x, u), x(0) = x_0,$$

which are nearly optimal w.r.t. a given cost

$$J(x_0) = \min_u \left\{ \psi(x(T)) + \int_0^T L(x(t), u) dt \right\}.$$

This problem is known to have no solutions in terms of continuous controls. One has therefore to introduce a suitable class of discontinuous feedback controls $U(x)$ such that the corresponding system of ODEs still has Caratheodory solutions, and to verify that in such a class there exists a control which almost minimize the prescribed cost. The main result is concerned with the existence of a nearly optimal control among patchy controls, a class of piecewise constants control which is known to satisfy good robustness properties.