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# Optimal Control and a Generalized Hamiltonian System

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We study time-optimal problems for  $n$ -dimensional systems controlled by a bounded  $k$ -dimensional control, where  $k < n$ .

Pontryagin Maximum Principle essentially reduces the study of optimal solutions to the Hamiltonian system with a discontinuous right-hand side.

We show that under certain generic conditions solutions of the system are piecewise smooth and effectively compute the left and right limits of their derivative at the nonsmooth points.