Asymptotic controllability with a cost

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Abstract

We consider a control problem where the state must reach asymptotically a target $\mathbf{C}$ while paying an integral payoff with a *non-negative* Lagrangian l. The dynamics f is just continuous, and no assumptions are made on the zero level set of the Lagrangian l. Through an inequality involving a positive number k and a *Minimum Restraint Function* $U = U(x)$ –a generalization of a Control Lyapunov Function– we provide a condition implying that **(i)** the control system is asymptotically controllable, and **(ii)** the value function is bounded by U/k.