

Poggiolini, Laura; Stefani, Gianna

State-local optimality of a bang–bang trajectory: a Hamiltonian approach. (English)

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Summary: We give a sufficient condition for a bang–bang extremal $\hat{\chi}$ to be a strong local optimizer for the minimum time problem with fixed endpoints. We underline that the conditions imply that the optimum is local with respect to the state and not necessarily to the final time. Moreover, it is given through a finite-dimensional minimization problem, hence is suited for numerical verification. A geometric interpretation through the projection of the Hamiltonian flow on the state space is also given.

MSC:

- 49K15 Optimality conditions for problems involving ordinary differential equations
- 49K30 Optimality conditions for solutions belonging to restricted classes (Lipschitz controls, bang-bang controls, etc.)
- 93B29 Differential-geometric methods in systems theory (MSC2000)
- 93C15 Control/observation systems governed by ordinary differential equations

Cited in **2** Reviews
Cited in **13** Documents

Keywords:

Minimum time; Bang–bang control; Sufficient conditions; Second variation; Hamiltonian methods

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