

Infinite Horizon problems on Stratifiable State Constraints sets

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Abstract

This paper deals with a state-constrained control problem. It is well known that, unless some compatibility condition between constraints and dynamics holds, the value function has not enough regularity, or can fail to be the unique constrained viscosity solution of a Hamilton-Jacobi-Bellman (HJB) equation. Here, we consider the case of a set of constraints having a stratified structure. Under this circumstance, the interior of this set may be empty or disconnected, and the admissible trajectories may have the only option to stay on the boundary without possible approximation in the interior of the constraints. In such situations, the classical pointing qualification hypothesis are not relevant. The discontinuous value function is then characterized by means of a system of HJB equations on each stratum that composes the state constraints. This result is obtained under a local controllability assumption which is required only on the strata where some chattering phenomena could occur.

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References

- [1] C. HERMOSILLA AND H. ZIDANI, *Infinite horizon problems on stratifiable state constraints sets*, submitted.