SYNTHESIS OF OPTIMAL CONTROLLED TRAJECTORIES WITH CHATTERING ARCS

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Abstract. A field theoretic approach that is based on the method of characteristics is outlined to prove the optimality of a synthesis of controlled trajectories that contains chattering arcs. Since the corresponding controls are not piecewise continuous - they switch infinitely many times on finite intervals - the classical argument by Boltyansky to prove differentiability of the associated value function is no longer applicable. This difficulty is overcome by matching the two parameterized families of extremal controlled trajectories that correspond to the constant controls \(u = \pm 1\) at the switching surfaces in a continuously differentiable way.

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References


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