
A NOTE ON THE TIME-OPTIMAL CONTROL OF LINEAR SYSTEMS

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ABSTRACT

The time-optimal control of linear systems is one of the problems in the mathematical theory of optimal control and has attracted much attention over the years. The time-optimal control problem aims to find the minimum time in which a controlled object, the movement of which is described by a system of ordinary differential equations can be transferred from a given initial position to a given final position. These problems can be thought of as a particular instance of the Bolza or Mayer problems in variational calculus, and they are obtained from these problems by the peculiar form of the functional to be optimized. In this study, we examine the problem of controlling a linear system in a time-optimal manner. We solve a range of these control problems by using the Pontryagin maximum principle which is indeed a kind of first-order necessary conditions on time optimal controls.

Keywords Time-optimal control · Pontryagin Maximum Principle

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