

Time-optimal control under chance constraints

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Time optimal control is a classical problem in control theory.

In the case that the initial state is known exactly, the problem is to find a feasible control that steers the system exactly to the prescribed target state as fast as possible. For systems where the initial state is uncertain, the statement of the problem has to be modified to take into account this uncertainty. We replace the exact target condition by the condition that a certain norm of the difference of the actual final state and the desired target state is less than a given value ϵ with a probability that is larger than a prescribed parameter p . In this way we prescribe a probabilistic terminal condition. We are looking for a control such that this chance-constraint is satisfied as fast as possible.

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