## Time Optimal Control of a Double Water-tank System

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**Abstract:** In this talk we discuss the time optimal control of a double water-tank system. The specific character of this problem is the switching switching between a finite number of different dynamic systems. In view of the known results in hybrid control theory we restrict the generality of our problem: We suppose, that switchings neither lead to discontinuities in the state trajectories nor to additional switching costs.

For the description of a switching strategy (this means a number of switchings, their locations and the transitions between the different control systems at these locations) we introduce a non-standard control variable, the partitions of the time interval. The advantage is, that instead of comparing only processes with the same switching behavior we are able to optimize over the set of all switching strategies.

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