Texas Tech University. Applied Mathematics Seminar.

Receding horizon based optimization of Boolean control networks

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ABSTRACT. Boolean network is a simple model of genetic regulatory networks, and it can also be used to represent dynamic finite games. The infinite horizon of optimization of probabilistic Boolean control networks is considered. We use the receding horizon control approach, and prove that when the filter length is large enough, the obtained control sequence coincides with the optimal control. Then, it is shown that the optimal control is state-feedback. Thus, the searching infinite sequence of controls is turned into finding optimal feedback control by solving finite horizon optimization problem. Based on this result, for deterministic Boolean control network, an alternative method for finding optimal control is obtained.