Multiply Closed Control Strategy in a Linear Terminal Problem of Optimal Guaranteed Control

N. M. Dmitruk[1]

Abstract—This paper deals with an optimal control problem for a linear discrete system with disturbances. It is required to steer the system robustly to a given terminal set in a finite time while minimizing the guaranteed value of a terminal cost function. A multiply closed control strategy is introduced under the assumption that, at several future time instants, the state of the system is measured exactly and the control input is corrected. An efficient numerical method for constructing a suboptimal multiply closed strategy is proposed. The results of numerical experiments show an improvement in the performance under the optimal control strategy when the number of closing instants increases as well as in comparison to the optimal open-loop worst-case control while maintaining comparable computation times.

Keywords: linear system, disturbances, robust optimal control, control strategy, algorithm.

---
[1]Belarusian State University, Minsk, 220030 Belarus
e-mail: dmitrukn@bsu.by