

Diffusive Realization of a Lyapunov Equation Solution, and Parallel Algorithms Implementation

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Abstract

In two previous works [?] and [?], a theoretical framework of diffusive realization for state-realizations of some linear operators have been developed. Those are solutions to certain linear operator differential equations posed in one-dimensional bounded domains. They illustrate the theory on a Lyapunov equation arising from optimal control theory of the heat equation. In principle their method might be very efficient for real-time computation, however it is suffering from strong limitations. Here, we present significant improvements and report numerical results. A method of contour optimization is provided. It is based on a theoretical error estimate of the solution. Finally, we discuss expected gains if the method is implemented on different parallel computer topologies. The envisioned applications are for real-time distributed control on distributed computing architectures.

Références

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