

Consensus with constrained convergence rate and time-delays *

Irinel-Constantin Morărescu, Silviu-Iulian Niculescu,
Antoine Girard

In this paper we discuss consensus problems for networks of dynamic agents with fixed and switching topologies in presence of delay in the communication channels. The study provides sufficient agreement conditions in terms of delay and the second largest eigenvalue of the Perron matrices defining the collective dynamics. We found an exact delay bound assuring the initial network topology preservation. We also present an analysis of the agreement speed when the asymptotic consensus is achieved. Some numerical examples complete the presentation.

*Irinel-Constantin Morărescu and Antoine Girard are with Joseph Fourier University, Jean Kuntzmann Laboratory, Tour IRMA, 51 rue des Mathématiques, 38400 Saint Martin d'Hères, France. (e-mail: irinel-constantin.morarescu@inrialpes.fr, antoine.girard@imag.fr), Silviu-Iulian Niculescu is with L2S (UMR CNRS 8506), CNRS-Supélec, 3, rue Joliot Curie, 91192, Gif-sur-Yvette, France. (e-mail: Silviu.Niculescu@lss.supelec.fr)