

Title:

Consensus on the median value: a finite-time protocol and the influence of outlier and uncooperative agents

Presenter:

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Abstract:

In this talk we present a local interaction protocol in continuous time that solves the consensus problem on the median value, i.e., it provides distributed agreement in networked multi-agent systems where the quantity of interest is the median value of the agents' initial values. In contrast to the average value, the median value is a statistical measure inherently robust to the presence of outliers, which is a significant robustness issue in large-scale sensor and multi-agent networks. The proposed protocol requires only binary information regarding the relative state differences among the neighboring agents and achieves consensus on the median value in finite time by exploiting a suitable ad-hoc discontinuous local interaction rule. In addition, we show certain resiliency properties of the proposed protocol for a spacial class of networks against the presence of oblivious uncooperative agents which do not implement the underlying local interaction rule whereas they interact with their neighbors thus influencing the network.