Distributed asynchronous consensus methods for systems with bandwidth-limited communication links

Bachelor / Master thesis

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Description:
In this project, we will study the distributed average consensus problem in multi-agent systems in which each node can communicate directly only with its neighbors, as determined by a (directed) communication topology, subject to quantized information flow. The student will revise the current literature and develop distributed algorithms that operate under bandwidth-limited communication links and fully asynchronously.

Keywords: Distributed coordination, asynchronicity, large-scale problems, communications.

Deliverables:

- A thesis in which the current state-of-the-art is briefly described, some methods are implemented and compared, and possibly a new approach is proposed.

Work type: 30% literature review, 30% simulations, 40% theoretical analysis

Tools: MATLAB

References:
[1] Apostolos I. Rikos, Christoforos N. Hadjicostis, Karl H. Johansson, “Non-oscillating quantized average consensus over dynamic directed topologies”, Automatica, Volume 146, Pages 110621, 2022.