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## An overview of the consensus problem in the control of multi-agent systems

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### Abstract

As a solution to the distributed multi-agent coordination, the problems of consensus or agreement have been widely explored and studied in the literature. This document provides an overview of consensus problems in multi-agent cooperative control with the goal of exposing the related literature and promote the research in this area. The document presents the theoretical results concerning the search for consensus in the involved topologies with information exchange that is invariant in time and change dynamically. Applications related to consensus protocols are studied for the cooperation of multi-agent systems. The presentation includes as well open problems and offers future research direction.


### Keywords

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## Cited References: 126

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(from Web of Science Core Collection)

- 1. The Extreme Doubly Stochastic Quadratic Operators on Two Dimensional Simplex**

By: Abdulghafor, R.; Turaev, S.; Abubakar, A.; et al.

2015 4th International Conference on Advanced Computer Science Applications and Technologies (ACSAT) Pages: 192-7 Published: 2015

Times Cited: 4
- 2. Dynamics classifications of extreme doubly stochastic quadratic operators on 2D simplex**

By: Abdulghafor, R; Shahidi, F; Zeki, A.

Adv Comput Commun Eng Technol Proc ICOCOE Volume: 2015 Issue: 362 Pages: 323 Published: 2015

Times Cited: 1
- 3. Dynamics classifications of extreme doubly stochastic quadratic operators on 2D simplex**

By: Abdulghafor, R; Shahidi, F; Zeki, A.

Advanced computer and communication engineering technology Pages: 323-335 Published: 2016

Publisher: Springer Cham, Heidelberg

Times Cited: 4
- 4. A high degree of nonlinear consensus for multi-agent systems**

By: Abdulghafor, R; Turaev, S; Zeki, A.

Inf Technol Control Pages: 1-20 Published: 2017

Times Cited: 2
- 5. Reach a nonlinear consensus forMAS via doubly stochastic quadratic operators**

By: Abdulghafor, R; Turaev, S; Zeki, A.

Int J Control. Volume: 91 Pages: 1-29 Published: Apr. 2017

Times Cited: 2
- 6. Nonlinear consensus for multi-agent systems using positive intractions of doubly stochastic quadratic operators**

By: Abdulghafor, R.; Turaev, S.; Izzuddin, M.

International Journal on Perceptive and Cognitive Computing Volume: 2 Issue: 1 Pages: 19-22 Published: 2016

Times Cited: 4
- 7. Linear and nonlinear stochastic distribution for consensus problem in multi-agent systems**

By: Abdulghafor, R; Abdullah, SS; Turaev, S.

Neural Comput Appl Pages: 1-17 Published: 2018

Times Cited: 1
- 8. Necessary and sufficient conditions for complementary stochastic quadratic operators of finite-dimensional simplex**

By: Abdulghafor, R; Turaev, S; Zeki, A.

Sukkur IBA J Comput Math Sci Volume: 1 Issue: 1 Pages: 22-27 Published: 2017

Times Cited: 1
- 9. The Convergence Consensus of Multi-agent Systems Controlled via Doubly Stochastic Quadratic Operators**

By: Abdulghafor, Rawad; Turaev, Sherzod; Zeki, Akram; et al.

2015 INTERNATIONAL SYMPOSIUM ON AGENTS, MULTI-AGENT SYSTEMS AND ROBOTICS (ISAMSR) Pages: 59-64 Published: 2015

Times Cited: 4
- 10. Consensus of fractional nonlinear dynamics stochastic operators for multi agent systems**

By: Abdulghafor, Rawad; Turaev, Sherzod

INFORMATION FUSION Volume: 44 Pages: 1-21 Published: NOV 2018

Times Cited: 4
- 11. NONLINEAR CONVERGENCE ALGORITHM: STRUCTURAL PROPERTIES WITH DOUBLY STOCHASTIC QUADRATIC OPERATORS FOR MULTI-AGENT SYSTEMS**

By: Abdulghafor, Rawad; Turaev, Sherzod; Zeki, Akram; et al.

JOURNAL OF ARTIFICIAL INTELLIGENCE AND SOFT COMPUTING RESEARCH Volume: 8 Issue: 1 Pages: 49-61 Published: JAN 2018

Times Cited: 1
- 12. Dynamics of doubly stochastic quadratic operators on a finite-dimensional simplex**

Times Cited: 4