



IEEE Open Journal of Control Systems (OJ-CSYS)

Special Section on Synchronization in Natural and Engineering Systems

Synchronized behaviors arise spontaneously and by design in various natural and man-made systems. For instance, distinctive network-wide patterns of synchrony determine the coordinated motion of orbiting particle systems, promote successful mating in populations of fireflies, regulate the active power flow in electrical grids, and enable numerous cognitive functions in the brain. While some systems rely on synchronization of all units to function properly, other systems exhibit a rich repertoire of synchronized behaviors including cluster synchronization, chimera states, explosive synchronization patterns, and even transient, cross-frequency, and phase-amplitude synchronization. These coordinated behaviors can emerge from the properties of the interconnection structure among the units, be the result of the dynamics of the isolated units, rely on the interplay of structure and dynamics, or be driven by exogenous stimuli.

Despite being one of the most studied phenomena in science and engineering, the principles underlying general synchronization patterns in complex systems and, importantly, effective methods to regulate different forms of synchronized behaviors, have remained elusive.

Prospective authors are invited to submit original contributions on related topics including, but are not limited to, the following:

- Synchronization metrics for single- and multi-layer networks
- Analysis methods for approximate and time-varying synchronization
- Techniques to characterize stable synchronization manifolds
- Basin of attraction and robustness of synchronization manifolds
- Model-based and data-driven methods to control synchronized behaviors
- Design principles leading to desired synchronized evolutions
- Optimization methods for the design and control of synchronization
- Resilience, safety, and security of synchronization processes
- Emerging applications of synchronization methods and benchmarks

Special Section Schedule:

- **Special Section Submission Window: 15 September 2022 – 15 March 2023**
- Notification of reviews of and recommendations: 10 weeks after initial submission
- Final notification of regular papers: 20 weeks after initial submission
- Manuscript publication on IEEE Xplore: 24 weeks after initial submission
- * Review process starts at time of manuscript submission

Submission Site: <https://css.paperplaza.net/>

Length: 12 pages or under, not including references. Justification of longer papers is required.

***Open Journal of Control Systems (OJ-CSYS)** is a new IEEE journal which covers significant theoretical and applied developments that impact the field of dynamic systems and control. The field integrates elements of sensing, communication, decision and actuation components as relevant for the analysis, design and operation of dynamic systems and control. The systems considered include: technological, physical, biological, economic, organizational and other entities, and combinations thereof.*

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