

SCIENCE CHINA Information Sciences

Call for Papers

Special Topic: Advanced Control for Nonlinear Systems: Theory, Methods, and Applications



Nonlinear dynamics are widespread in modern engineering and physical systems. Advanced nonlinear control strategies have become essential for achieving high performance when traditional linear approximations are insufficient. As systems grow more complex and communication networks, multi-agent technologies, and artificial intelligence advance rapidly, nonlinear control theory and practice are evolving to address key challenges in closed-loop stability, coordination, efficiency, and resource optimization.

This Special Topic provides a platform for sharing cutting-edge research results and highlighting recent advances in nonlinear systems control. Topics of interest include, but are not limited to, the following:

(1) High-Performance Nonlinear Control and Applications: Fundamental theoretical developments and practical designs in advanced nonlinear control methodologies. This topic includes a wide range of synthesis and analysis techniques for addressing severe system nonlinearities, coupled dynamics, and unmodeled behaviors. The focus is on achieving high precision, fast transient response, robust stability, and strict asymptotic tracking in nonlinear control, with applications in modern engineering fields.

(2) Safe and Trustworthy Control: Theory and practical designs that ensure safety, reliability and performance in the presence of uncertainties, constraints, disturbances, faults, and cyber-physical threats. The focus is on developing rigorous and trustworthy control solutions for safety-critical applications, including autonomous systems, robotics, aerospace systems, smart grids, and industrial cyber-physical systems.

(3) Event-Triggered and Resource-Aware Control: Novel event-triggered, self-triggered, and aperiodic sampling control mechanisms for nonlinear systems. These methods update control actions based on real-time system states and performance thresholds instead of traditional periodic execution. The objective is to reduce communication resource use, computational load and energy consumption while ensuring closed-loop stability and dynamic performance, in various setups including standalone systems and networked environments.

(4) Learning-Enabled Control and Optimization: Methods of reinforcement learning-based control, data-driven optimization, and physics-informed control for complex nonlinear systems. Our focus is on mitigating model-plant mismatch and data scarcity, integrating physical knowledge with learning, and guaranteeing robustness, computational efficiency and interpretability in control and optimization.

(5) Distributed Control and Multi-Agent Coordination: Advances in consensus tracking, formation control, containment control, and flocking for nonlinear multi-agent systems. Emphasis is placed on addressing unknown disturbances, directed communication topologies, time-varying delays, and complex cooperative or competitive interactions among agents.

Submission

The papers should be prepared using the SCIS template, and should be submitted online through the manuscript submission system of the SCIENCE CHINA Information Sciences. The submission website is <https://mc03.manuscriptcentral.com/scis>. You should choose “**Special Topic: Advanced Control for Nonlinear Systems: Theory, Methods, and Applications**”. Information and guidelines on preparation of manuscripts are available on the journal website <http://scis.scichina.com>.

Important Dates

Submission deadline: **October 31, 2026**
First Round of Reviews: December 31, 2026
Final Acceptance: February 28, 2027
Publication: June 1, 2027

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