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Editor-in-Chief: Professor James Lam, University of Hong Kong, Hong Kong

Special Issue:

Recent Developments on Sliding Mode Control
and Its Applications for Complex Systems

Over the past few decades, sliding mode control (SMC) theory has been widely applied in practical complex systems including robot manipulators, spacecraft, vehicles, power systems, and automotive engines, etc. It has been proven to be an efficacious control methodology to reject matched nonlinearities, disturbances and perturbations. The main technical characterisation of an SMC is to force the system state trajectories onto some predefined sliding surfaces (linear sliding surface, integral sliding surface and terminal sliding surface) by utilizing a discontinuous control, such that the state trajectory will achieve a desired performance such as stability, tracking ability and disturbance rejection capability. In the past few years the investigations of SMC have received significant attention, whereas chattering phenomenon is one of the main limitations of SMC.

Furthermore, some combined SMC methodologies have been developed such as adaptive SMC, fuzzy SMC and backstepping SMC for a wide spectrum of systems including nonlinear, time-varying, discrete, large-scale, infinite-dimensional, stochastic, and distributed systems. Therefore, it is still interesting and challenging to develop novel theories of SMC for complex and nonlinear systems due to modern practical application potentials.

The main objective of this Special Issue is to exhibit recent developments in methodologies, techniques, and applications of SMC including issues such as actuator/sensor fault tolerant control, output-feedback-based SMC, fault detection, integral SMC, fuzzy SMC and adaptive SMC, etc. Both theoretical and application results are sought for. This issue will offer a concentrative venue for researchers to make a rapid exchange of ideas and original research findings in SMC and their applications. In particular, new interdisciplinary approaches in SMC theory and engineering application, or strong conceptual foundation in newly evolving topics are especially welcome. We invite worldwide researchers and experts to submit high-quality original research papers and critical survey articles on the following potential topics, but are not limited to:

- Advanced SMC techniques
- SMC based stochastic systems
- Adaptive SMC
- Hybrid SMC design
- Chattering analysis
- Network-based SMC
- Discrete time SMC
- Sliding mode observer (SMO) design
- Fuzzy SMC
- Integral SMC
- SMO based fault detection
- Applications of SMC

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For enquiries regarding this Special Issue please contact the Guest Editors:

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Prof. Hongyi Li
Bohai University
China
E: lihongyi2009@gmail.com

Prof. Hamid Reza Karimi
University of Agder
Norway
E: hamid.r.karimi@uia.no

Prof. Haiping Du
University of Wollongong,
Australia
E: hdu@uow.edu.au

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IET Control Theory & Applications

IET Research Journals Dept.
Michael Faraday House
Six Hills Way
Stevenage
SG1 2AY
United Kingdom

Kruna Vukmirovic, Executive Editor (IET Research Journals)

T: +44 (0)1438 765504

E: iet_cta@theiet.org

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