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Asian Journal of Control

“Advances in Fractional Order Control and Estimation”

A Special Issue of the Asian Journal of Control

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Fractional Calculus (FC) is simultaneously a new and old research issue. The concept of fractional (or, more precisely, non integer) differentiation appeared first in a famous correspondence between Marquise de L'Hospital and G. Leibniz, in 1695. Many mathematicians have further developed this area and we can mention the studies of Euler (1730), Laplace (1812), Abel (1823), Liouville (1832) and Riemann (1847), to cite a few. However, FC remained for centuries a purely theoretical topic, with little if any connections to practical problems of physics and engineering.

In the last decades non integer differentiation has become a more and more popular tool for modeling the complex behaviours of physical systems from diverse domains such as mechanics, electricity, chemistry, biology, economics, and many others.

The long-range temporal or spatial dependence phenomena inherent to the Fractional Order Systems (FOS, i.e., systems described by means of fractional-order integro-differential operators) present unique and intriguing peculiarities, not supported by their integer-order counterpart, which raise exciting challenges and opportunities related to the development of control and estimation methodologies involving fractional order dynamics. This special issue aims to bring together the latest advances in the theory and application of fractional control and estimation for dynamical systems.

Topics of this special issue include, but are not limited to, the following aspects: (1) Fractional control of linear, nonlinear and distributed-parameter systems; (2) State observation and fault detection in FOS (3) Practical engineering applications of fractional controllers and observers.

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Call for Papers

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