

Special Issue on **Intelligent Control Approaches for Modeling and Control of Complex Systems**

CALL FOR PAPERS

For the purposes of this special issue, a complex system is any system featuring a large number of interacting components whose aggregate activity is nonlinear and hence not derivable from the summations of the activity of individual components. As control methods are normally applied to dynamical systems, we are interested in complex dynamical systems.

The rising complexity of man-made engineering systems (e.g., power networks, aircraft, autonomous vehicles, and communication networks) causes us increasing difficulties to understand their behavior and to obtain accurate first-principle dynamical models to describe them, which reduces our capability to control those systems and make them behave in the way we want.

Intelligent control refers to approaches to control systems design, modelling, identification, and operation that use artificial intelligence techniques, such as fuzzy logic, neural networks, machine learning, evolutionary computation, and genetic algorithms. Intelligent control techniques are often capable of controlling dynamical systems that, because of their complexity, are very difficult to control by other techniques.

Intelligent control systems are characterized by attempts to emulate important aspects of biological intelligence. These aspects include, for instance, adaptation and learning, planning under uncertainty, and decision making. Intelligent control is interdisciplinary in nature as it seeks inspiration from biology, and it combines and extends theories and methods from areas such as control theory, mathematics, and computer science.

The aim of this special issue is to bring together the latest advances and trends in the application of intelligent control to the modeling and control of complex systems.

Potential topics include but are not limited to the following:

- ▶ Identification and modeling of complex systems using artificial intelligence
- ▶ Design of intelligent controllers for complex systems
- ▶ Applications of intelligent control to complex engineering systems
- ▶ Learning control of complex systems
- ▶ Analysis of stability and robustness of intelligent control systems
- ▶ Hybridization techniques in intelligent control
- ▶ Intelligent control of complex networks
- ▶ New trends in intelligent control of complex systems

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Papers are published upon acceptance, regardless of the Special Issue publication date.

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