Mathematical Problems in Engineering

Hindawi

Special Issue on

Advanced Observer-Based Control for Benchmark Control Problems: From Mathematical Modeling to Control Design

CALL FOR PAPERS

In the field of control theory, several benchmark systems of high interest exist in the literature and are frequently used as fundamental systems for testing emerging control algorithms. In spite of their simple structure, such systems have richest dynamics and still refer to challenging control problems.

In the other hand, despite being a relatively old subject in control theory, observer-based control design has regained much interest in the last few years due to its significant potential to solve many engineering problems. The nonexact knowledge of systems dynamics, lack of state measurements, and presence of uncertainties and perturbations could justify such attention. The separation principle of the controller-observer design is at the heart of this challenging problem in relation to rather conflicting requirements such as stability, performance, and robustness.

The first objective of this special issue is to bring the attention of the scientific community to the importance of mathematical modeling in the field of control systems. Our purpose is also to draw a state of the art of available benchmarks in this field by focusing on the wealth of their mathematical models able to solve many complex control problems. These benchmarks include the following engineering applications: industrial applications: rotary drilling system, stirring reactor with heat exchanger, distillation column, chemical reactor, three-tank process, four-tank process, and so on; mechanical applications: mass-spring-damper system, bouncing ball, TORA system, hard-disk drive system, magnetic levitation system, and so on; robotic applications: cart inverted pendulum, Furuta pendulum, reaction wheel pendulum, beam-and-ball, two-link flexible manipulator, and so on; automotive applications: vehicle dynamics system, diesel engine system, battery model, and so on; flight dynamics applications: VTOL aircraft, HL-20 vehicle, 747 Jet Aircraft, and so on.

The second objective of this special issue is to propose advanced observer-based control mathematical methods in relation to the last engineering problems.

Potential topics include but are not limited to the following:

- Observers based Lyapunov stabilization approaches
- Unknown input observers based robust controllers
- Super-twisting observers based uncertainties and disturbances
- PID, predictive, and robust control design based observers

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/mpe/aobc/.

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

Lead Guest Editor
Olfa Boubaker, University of Carthage, Tunis, Tunisia
olfa.boubaker@insat.rnu.tn

Guest Editors
Mihai Lungu, University of Craiova, Craiova, Romania
lma1312@yahoo.com

Binoy K. Roy, NIT Silchar, Assam, India
bkr_nits@yahoo.co.in

Luis J. Yebra, Platforma Solar de Almerla, Almeria, Spain
luis.yebra@psa.es

Submission Deadline
Friday, 3 August 2018

Publication Date
December 2018