Editorial

It is my great pleasure to introduce the special issue ``Modelling, Monitoring and Fault-Tolerant Control for Complex Systems''.

Owing to the development of systems theory and control engineering, advanced control methods and technologies have greatly improved the human's life quality and brought the huge progress in the social and scientific community. Recently, complex systems with stochastic behaviour, high non-linearlity, hybrid dynamics, uncertainties, and time delays, have drawn attention. Research on complex systems has been benefited from the interdisciplinary collaborations among mathematician, computer scientist, control engineers, and biologists etc.

For systems with faults in complex processes, it is vital to monitor and diagnose possible faults and give alarms as early as possible. The special issue is initiated by the paper from D. Huang and S. K. Nguang. The paper addressed robust fault estimation problems for a class of uncertain nonlinear networked control systems by using TS fuzzy model and H-infinity technique. The second paper is authored by M. G. El-ghatwary and S. X. Ding, which developed robust fuzzy fault detection filtering for a class of nonlinear systems with stochastic dynamics.

For complex systems subjected to changing environments, it is extremely important to recognize this kind of changes, and adjust control parameters to achieve fault-tolerant control. The third paper is contributed by R. J. Patton and S. Klinkhieo, in which an adaptive approach was developed to create active fault tolerant control procedure. To cope with the needs of the predictive maintenance for complex systems, a hybrid dynamic artificial neural network (ANN) based fault and degradation diagnosis and tolerance method was proposed by the fourth paper authored by R. Yu and T. Breikin.

Modelling and identification are one of significant issues, which is obviously foundation for systems regulations and control. In the fifth paper by Z. Ji and M. Brown, a joint state and parameter estimation for biochemical dynamic pathways was investigated by using iterative extended Kalman filters. The special issue is ended by the paper from J. Wang and Z. Gao, which addressed the improved fluid-model of TCP/AQM network for congestion control.

The special issue involves a variant of research issues for complex systems, such as fault monitoring, fault estimation, fault-tolerant design, network-based control, and biochemical modelling etc. It is pleased to provide a platform for the research community to share their knowledge and experience in complex modelling, monitoring and fault-tolerant design. Finally, I would like to take this opportunity to thank all the contribution from the authors, reviewers and publication department.

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