PREFACE TO THE SPECIAL ISSUE: NEURODYNAMIC SYSTEM ANALYSIS AND OPTIMIZATION WITH APPLICATIONS

In the past years, a significant amount of research on neurodynamic systems has been well developed. Among them, a lot of topics have inspired researchers' interests, such as Neurodynamic models of recurrent neural networks, neurodynamic optimization, control, collective neurodynamic systems, multi-agent systems, etc. As parallel computing units, neurodynamic systems can be used for real-time optimization, which has wide applications in science and engineering, such as robot control, signal processing, machine learning, and planning and decision making. Recently, with the development of artificial intelligence in big data as well as machine learning and related areas, the size and complexity of modern datasets are increasing explosively. In particular, for large-scale data in optimization computing, the collective technique has been developed for distributed/decentralized computing. Moreover, the multi-agent systems have brought much attention to researchers for distributed optimization with wide applications including source localization, power control, sensor networks, smart grid, regression of distributed data, and so on. The main focus of this special issue is concentrated on the new and existing models of neurodynamic systems with their applications in optimization and engineering problems. In the first article, the authors derive the analytical closed formulas for new topological indices of the probabilistic neural networks. In the second paper, the authors investigate the global exponential synchronization and quasi-synchronization of inertial memristive neural networks with time-varying delays. The third article is concerned with a continuous time-distributed algorithm based on the multi-agent network for solving decomposable quadratic programming problems. In the fourth paper, the authors discuss cluster consensus of linear multi-agent systems via a distributed event-triggered control scheme. Finally, the fifth article presents the method which determines the eigenvalue of the graphs from the structure of their complements.

Lead Guest Editor
Jinde Cao[1]

Guest Editor
Qingshan Liu[2]

[1]School of Mathematics, Southeast University, China; jdcao@seu.edu.cn
[2]School of Mathematics, Southeast University, China; qsliu@seu.edu.cn