Editorial

Stability Analysis Including Monostability and Multistability in Dynamical System and Applications

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Received 3 December 2013; Accepted 3 December 2013; Published 27 January 2014

Stability theory has been significantly developed and extended to dynamical system which will provide a deep insight into a more comprehensive understanding of the dynamic structure of complex dynamical systems and therefore is of great significance for its application. The overall aim of this special issue is to open a discussion among researchers actively working in the field of stability theory and relative applications. The issue covers a wide variety of problems for neural networks and applications such as image processing and pedestrian detection, difference equations, dynamic equations on time scales, biological mathematics including multigroup and reaction-diffusion epidemic model, and soft computing. In the following, we briefly review each of the papers by highlighting the significance of the key contributions.

In "*Periodic oscillation analysis for a coupled FHN network model with delays*" by Y. Lin, the author provides new results of periodic oscillatory behavior of three coupled FHN neurons model by Chafee's criterion of limit cycle. In "*Dynamical behaviors of the stochastic hopfield neural networks with mixed time delays*" by L. Wan et al., the authors of this paper investigate dynamical behaviors of the stochastic Hopfield neural networks with mixed time delays.

By employing the theory of stochastic functional differential equations and linear matrix inequality (LMI) approach, some novel criteria on asymptotic stability, ultimate boundedness, and weak attractor are derived.

Two papers in our special issue are devoted to discuss applications of neural networks. In "*Analysis of feature fusion based on HIK SVM and its application for pedestrian detection*" by S.-Z. Su and S.-Y. Chen, the author adopt support vector machine (SVM) with the histogram intersection kernel (HIK) as a classifier to detect pedestrians in low-resolution visual images and at night time. In "*Recursive neural networks based on PSO for image parsing*" by G.-R. Cai and S.-L. Chen, the authors give an image parsing algorithm based on Particle Swarm Optimization (PSO) and Recursive Neural Networks (RNNs).

A theoretical article titled "*Lω-compactness in Lω-spaces*" presents some important properties of $L\omega$-compactness. The authors, S.-L. Chen and J.-L. Huang, reveal the Alexander subbase lemma and the Tychonoff product theorem with respect to $L\omega$-compactness.

Six papers are concerned about dynamical analysis of difference equations or dynamic equations on time scales. In "*Oscillation for higher order dynamic equations on time scales*"