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GUEST EDITORIAL

INTELLIGENT INFORMATION PROCESSING AND SYSTEM OPTIMIZATION

BY

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This special issue is devoted to new activities in intelligent information processing and system stimulation, while the focus is on theoretical and practical problems. The goal of this special issue is to provide an overview of the state of the art in this important field, and to collect significant research results about its new developments. The special issue contains 15 papers. These papers use a variety of techniques for intelligent computing and system optimization. There are various possible ways in which these papers can be grouped. We have organized them according to the kind of techniques and principles that are used for optimization of systems, simulation of complex systems, and image processing and analysis.

Among the 15 papers, four papers are about system optimization. The paper by J. Wang *et al.* presented a method to control the end-effector of a redundant manipulator tracking the surface closely with the assistance of tactile sensing, which is based on the idea of hybrid impedance control method. A 5-DOF redundant manipulator equipped with force/torque and tactile sensors is applied to test the proposed algorithm. G. Tan *et al.* proposed a robust H-infinity control method for three-phase PWM rectifier. An improved PSO algorithm was proposed in this paper by bringing the ideas of SA algorithm and chaotic search into the PSO algorithm. This improved PSO algorithm is used to optimize the parameters of the proposed controller. W. Pan *et al*. used a back-propagation neural network to accurately predict tobacco growth under various climatic and

soil conditions in China. J. Zhou and J. Yang proposed an SVM model to predict the life of bridge structure, in which the SVM model is modified by using geometric chaotic analysis.

Three papers are about the multi-agent simulation. With the data collected from Kaixin website, a multi-agent rumor spread model in virtual community R. Xiao *et al.* is established based on the analysis of rumor spread pattern. According to this model, some simulations are conducted to show the impact of network structure, tolerance frequency, and believing rate to rumor spread. In order to solve water resources allocation and scheduling management, C. Li *et al.* designed a multi-Agent computation platform which can support the optimal scheme set, and build a functional structure model of multi-Agent computation platform. The proposed algorithm generates the optimal scheme set by using the multi-Agent computation platform based on the genetic algorithm. W. Huang *et al.* proposed a model for the South-to-North Water Diversion Eastern Route Project of China based on multi-Agent calculation and complex adaptive system.

In this special issue, eight papers are about the image processing using intelligent computing. S. Hu *et al.* proposed a content-aware retargeting method for adapting soccer video to heterogeneous terminals. They optimize the retargeted region to contain more semantic content while adapting the constraint of terminal screen. A. Shi *et al.* proposed a fusion method using maximum likelihood (ML) estimation. The authors use the sensor characteristics to model the observation process of both multispectral and panchromatic images. These models are used to estimate high-resolution MS images based on the ML estimation. Z. Qiu *et al.* developed two methods to face recognition, one method is to transform from Linear discriminate analysis (LDA) to principle component analysis with the discriminative information embedded in a whitening transformation, another is a support vector machine (SVM) method of LDA. Inspired by the mechanism of multi-scale image fusion of insect compound eye, H. Wang *et al.* developed a target detection and extraction method based on insect compound eye and human visual attention mechanism. For feature matching in 3D computer vision, S. Chen *et al* proposed a novel method which combines the global and local information algorithm, which can perform well when the scene is comprised with planar or curved surfaces. W. Cui *et al.* explored a Minimum Span Tree (MST) based multi-level image segmentation method, this makes it is a simple and easy way to realize multi-level hierarchy image segmentation. X. Li *et al.* proposed a method with back-propagation neural network to recognize the shape of the vehicle. The paper by X. Liao considers the problem of modelling the topics in a sequence of images with known time stamp. The authors proposed an extension of the Probabilistic Latent Semantic Analysis(PLSA) model to extract topics among images and tract how topics change over time.

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