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EDITORIAL

Thematic issue on "bio-inspired learning for data analysis"

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Data analytics, data mining and knowledge discovery from data are becoming increasingly important for solving complex real world problems across engineering, science and business management. In addition, many real world problems can be formulated as optimization problems, in which models can be built or knowledge can be extracted from data using learning techniques to help solve the problems more efficiently.

This issue aims to present a collection of recent advances in learning and optimization using bio-inspired techniques and other learning methods. Based on a peer-review process, seven papers were accepted to be included in the thematic issue, covering various applications ranging from classification, object recognition, control, optimization and business. The first paper titled "Fast Distant Support Vector Data Description" by *Ling et al* paper proposes a fast distant support vector data description (fdSVDD) algorithm to reduce the computational complexity and ease the parameterization of SVDD algorithms. This is achieved by introducing a new objective that is equivalent to dSVDD's original objective, whose least square version is used as the objective of fdSVDD. The second paper, "Thermal Image Colorization Using Markov Decision Processes" by *Gu et al*, employs the Markov Decision Processes (MDP) to deal with the computational complexity of the colorization problem. The authors exploit the MDP for neighborhood analysis and probabilistic classification to solve chromatic estimation. Experimental results demonstrate the effectiveness and high time efficiency of the proposed method. The paper "Target re-identification based on adaptive incremental KISS measure learning" by *Han et al*, addresses target re-identification, which is a challenging problem in multi-camera surveillance. For this purpose, the paper extends the Keep It Simple and Stupid (KISS) measure learning algorithm by proposing an adaptive incremental Keep It Simple and Stupid Measure Learning (AIKISSME). Extensive experimental results on viewpoint invariant pedestrian recognition indicate that AIKISSME outperforms several existing algorithms.

The fourth paper "Initial states iterative learning for three-dimensional ballistic endpoint control" by *Liu et al* employs the iterative learning algorithm for control of the ballistic endpoint displacement in three-dimensional space. The proposed algorithm consists of two parts. First, the initial speed and angles are iteratively learned to make the projectile attain a fixed position. Second, the shooting time is learned to tune the arrival time of the projectile. An example of practical cannonball projection is presented to verify the effectiveness of the proposed algorithms. The fifth paper "The Bionic Increment Model of Fashion Industry Value Chain based on Multicellular Network" by *Liu et al* analyzes the value chain increment mechanism of fashion industry development in different social environments and economic development situations. In the paper, the authors propose a bionic increment model of the fashion industry value chain (FIVC) based on a multicellular network structure. The main factors influencing the increment in the FIVC are regarded as symbiotic biological tissue cells in a multicellular network structure and then the relationships between the cells of different biological tissues in various simulated environments are analyzed. A simulated analysis based on a simplified six-cell network is used to demonstrate the flexibility of the bionic increment model. From the simulation results, it is found that the multicellular tissue network model is able to effectively simulate

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the incremental process of the FIVC and has both practical and theoretical significance. To address the delays and noise interference in distributed multi-channel hybrid networks, the paper titled "Distributed event-triggered hybrid wired-wireless networked control with H_2/H_∞ filtering" by *Du et al* firstly employs a distributed event-triggered mechanism to reduce communication overhead, and then uses two Markov chains to describe different characters of network-induced delays of hybrid wired-wireless networks. Afterwards, a H_2/H_∞ filter is adopted to improve the input signal precision of the controller. Simulation results confirm the effectiveness of the proposed method. The final paper, titled "A Combined Constraint Handling Framework: An Empirical Study" by *Si et al*, presents a new combined constraint handling framework for solving constrained optimization problems. The framework combines a feasibility-based rule with a multi-objective optimization technique. The paper demonstrates that multi-objective optimization technique essentially can be expressed in the form of penalty function method. Empirical studies show that the combined method shows competitive performance on a large number of widely used benchmark test functions.

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