Intelligent Automation & Soft Computing
DOI: 10.32604/iasc.2020.010132
Guest Editorial

Special Section
Industrial Informatics-Based Applications and Techniques in Intelligent Automation

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Knowledge in the Information Society Technologies field envisions a technology bifurcation in the field of intelligent automation systems and real-time middle-ware technologies in the recent years. This technology bifurcation extends networked embedded intelligence at the real-time production control and re-scheduling levels further than is currently possible, allowing for a completely new range of intelligent automation products and services. Such products and services enable new paradigms of production and new concepts of product-services and new intelligent production automation concepts, which are more agile, flexible and integrated, based on agent-based technology.

A methodology of on-line monitoring the diameter of the cathode electrode is put forward by Li and Xiong (Research on Dynamic Compensation System of Cathode Electrode Wear for Short Electric Arc Machine Tool) in view of the issue that the diameter of cathode electrode cannot be detected in an accurate manner in the short electric arc machine tool. A three-dimensional model describes the spatial information and characteristic information of each geological unit should meet the needs of the expression and analysis of heterogeneous geological bodies (Study on Mathematical interpolation and correction of three - dimensional modeling of high-speed railway). Liu et al. (Research on Agent-based Economic Decision Model System) proposed the task-oriented Agent design idea, and designs multiple types of Agents to complete the decision-making tasks with the task as the core. Intelligent flexible system is a powerful means for manufacturing enterprises to achieve high efficiency and high output. The physical structure of the flexible system is constructed by Liu et al. (Design and Application Research of Digitized Intelligent Factory in Discrete Manufacturing Industry). A theoretical and mathematical model of hydraulic fracturing is established by Li (Numerical simulation study on the regularity of CIS bedding Hydraulic fracturing based on 3D Penny-Shape model). Based on the large-scale finite element software ABAQUS, numerical simulation of two dimensional and three dimensional hydraulic fracturing is carried out, and the fracture propagation law and its parameter sensitivity of coal seam point hydraulic fracturing are simulated and analyzed. A combined data envelopment analysis and Malmquist indices model have been used by Yang et al. (Low-carbon Efficiency Model Evaluation for China Iron and Steel Enterprises based on Data and Empirical Evidence). On the basis of the shortcomings of PSO and SA, Wang (Study on the Application of an Improved Intelligent Group Algorithm) paper offerings an enhanced intelligent group algorithm on the basis of the roulette rule to improve the parameter velocity ν of (PSO) and the initial temperature of SA algorithm. Tian et al. (Ontology-supported double-level model construction for international disaster medical relief resource forecasting) established a disaster medical relief planning model in 3 Steps. 1. Establishing the two-level conceptual model. 2. Using the ontology method to describe the hierarchy and relating rules of the terms and concepts associated with the model. 3. Using an ontology-support case-based reasoning approach to build the case similarity matching process, which can provide a more efficient system for decision support.

Acknowledgment: The guest editors would like to thank Prof. Mo Jamshidi who is the editor in chief for special section of Intelligent Automation & Soft Computing. His help and trust are the most important thing for the success of this SI. The guest editors would like to thank the reviewers for their high-quality reviews, which provided insightful and constructive feedback to the authors of the papers.