Intelligent computing in science and technology

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2 Editorial

The requirements demand in problem solving have been increasingly in demand in exponential way. The new technologies in computer science and engineering have reduced the dimension of data coverage worldwide. Thus, the recent inventions in Information and Communications Technologies have inched towards reducing the gaps, and coverage of domains globally. The digging of information in a large data, and the soft-computing techniques have contributed a strength in prediction, analysis, and decision potentials in the niche areas such as Computer Science, Technology, Management, Social Computing, Green Computing, and Telecom. Nurturing the research in Technology and Computing are evident that finding a right pattern in the ocean of data.

Additionally, classic optimization problems become even more complex in today's organizational environment. The topics of industry 4.0, logistics, social problems solved by optimization and the classic challenges in the manufacturing industry continue to be a challenge for new developments and research.

This special issue features six selected papers with high quality. The first article, "Binary monkey algorithm for approximate packing non-congruent circles in a rectangular container", authored by Rafael Torres-Escobar, José Antonio Marmolejo-Saucedo and Igor Litvinchev, proposed the packing problem for non-congruent (different size) circles with the binary version of the monkey algorithm which incorporates a cooperation process and a greedy strategy. The authors use a rectangular grid for covering the container. Every node in the grid represent potential positions for a circle. In this sense, binary monkey algorithm for the knapsack problem, can be used to solve de 0–1 approximate packing problem for non-congruent circles. The binary monkey problem uses two additional processes of the original monkey algorithm, these two processes are a greedy process and a cooperation process.

The second article titled "Nature-inspired meta-heuristics approaches for charging plug-in hybrid electric vehicle" present four swarm intelligence based optimization

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techniques: particle swarm optimization (PSO), gravitational search algorithm (GSA), accelerated particle swarm optimization, and hybrid version of PSO and GSA (PSOGSA) have been applied for the state-of-charge optimization of plug-in hybrid electric vehicles. In this research, hybrid PSOGSA has performed very well in producing better results than other stand-alone optimization techniques.

In the next article with the title “Vertical and horizontal integration systems in Industry 4.0”, Perez-Lara et al. propose and validate a methodological tool, for evaluating the technological and operational criteria within companies and place them in the right level for a transfer to the new industrial revolution, considering as well the vertical and horizontal systems in Industry 4.0. The evaluation tool will result in current vertical and horizontal level company integration. The study allows identifying gaps and opportunities to develop other blocks considered in Industry 4.0

The fourth article titled “Optimization of public resources through an ensemble-learning model to measure quality perception in the social protection system in health of Mexico” consider a model of ensemble learning to measure the perception of quality in the medical care granted to the people affiliated to the social protection in health system of Mexico. The study allows a more efficient allocation of resources based on the main areas of opportunity identified in the measurement of service quality. A satisfaction index was built using an ensemble model using principal component analysis, logistic model and bagging meta-estimator, to identify the effect of a group of factors in the perception of quality of health services and monitor the perceived quality of users in real time.

The fifth article, “Better campus life for visually impaired University students: intelligent social walking system with beacon and assistive technologies” proposed a introduce a novel, low-cost intelligent social walking path support system for visually impaired students in a wide campus area, by employing beacons, optimization based Artificial Intelligence techniques, Big Data support, and a system rising over Internet of Things. In detail, the developed system has been used within two connected campus areas of Suleyman Demirel University located in the city of Isparta in Turkey and an effective walking path support was ensured for enabling visually students to go target locations with instructions given by an intelligent system.

The last article titled “Effect of ICT integration on SC flexibility, agility and company’ performance: the Mexican maquiladora experience” reports a structural equation model (SEM) with four latent variables to measure the relationship between information and communication technologies (ICT) integration with supply chain flexibility, supply chain agility, and company’s performance. The

SEM integrates six hypotheses with relationships among variables and is validated with 378 responses from manufacturing sector to a questionnaire and partial least squares technique is used to evaluate it and test the hypotheses statistically. A sensitivity analysis is conducted in different scenarios to know conditional probabilities of occurrence of dependent variables, since a scenario has occurred in the independent variable with low and high success level.

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