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Editorial

Applied Computing and Artificial Intelligence

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Applied computing and artificial intelligence methods have been attracting growing interest in recent years due to their effectiveness in solving technical problems. The recent developments in applied mathematics have largely led to benefits in many industrial tasks in different fields, including the aerospace industry, manufacturing, transportation, energy, robotics, materials, informatics, etc. The objective of this Special Issue is to present advanced methods in applied computing and artificial intelligence to address the practical challenges in the related areas. The response of the scientific community has been remarkable, and a large number of papers have been submitted. After a careful peer-review process, 22 papers have been accepted and published at a high quality.

The paper by Saeed et al. [1] proposes an approach to building an AutoML data-dependent CNN model (DeepPCANet) customized for DR screening automatically. This approach tackles the limitations of the available annotated DR datasets and the problem of a vast search space and a huge number of parameters in a deep CNN model.

The paper by Osman et al. [2] studies an important arguments nomination technique based on the fuzzy labeling method for identifying plagiarized semantic text. The suggested method matches the text by assigning a value to each phrase within a sentence semantically. Semantic role labeling has several benefits for constructing semantic arguments for each phrase. The approach proposes nominating each argument produced by the fuzzy logic to choose key arguments. It has been determined that not all textual arguments affect text plagiarism.

The paper by Zhang et al. [3] proposes a new estimator, which is a convex combination of the linear shrinkage estimation and the rotation-invariant estimator under the Frobenius norm. They first obtain the optimal parameters by using grid search and cross-validation, and then, they use these optimal parameters to demonstrate the effectiveness and robustness of the proposed estimation in the numerical simulations.

In the paper by Park et al. [4], a method of detecting the delamination of composites using ML sensors is presented. A convolutional autoencoder (CAE) was used to automatically extract the delamination positions from light emission images, which offers better performance compared to edge detection methods.

In the paper by Etaiwi et al. [5], their study proposes a novel semantic graph embedding-based abstractive text summarization technique for the Arabic language, namely SemG-TS. SemG-TS employs a deep neural network to produce the abstractive summary. A set of experiments is conducted to evaluate the performance of SemG-TS and to compare the results to those of a popular baseline word-embedding technique called word2vec. A new dataset was collected for the experiments.

In the paper by Lu et al. [6], they propose a deep learning method using physics-informed neural networks (PINN) to predict the excess pore water pressure of two-

dimensional soil consolidation. The proposed deep learning approach can be used to investigate large and complex multidirectional soil consolidation.

Lu et al. [7] propose a deep learning-based method for a balance control ability assessment involving an analysis of the time-series signals from the athletes. The proposed method directly processes the raw data and provides the assessment results, with an end-to-end structure. This straightforward structure facilitates its practical application. A deep learning model is employed to explore the target features with a multi-headed self-attention mechanism, which is a new approach to sports assessments.

Lu et al. [8] study a novel deep learning-based RUL prediction method for the etching system. The transformer module and random forest are integrated in the methodology to identify the health state of the machine and predict its RUL, through training with the complex data of the etching machine's sensors and exploring its underlying features.

The paper authored by Gerogiannis et al. [9] considers the single-group scheduling models with Pegels' and DeJong's learning effect and the single-group scheduling models with Pegels' and DeJong's aging effect. Compared with the classical learning model and aging model for scheduling, the proposed models are more general and realistic. The objective functions are to minimize the total completion time. The polynomial time methods are proposed to solve all the studied problems.

Peng et al. [10] study the vibration of a rotating sandwich pre-twist plate with a setting angle reinforced by graphene nanoplatelets (GPLs). Its core is made of foam metal, and GPLs are added to the surface layers. Supposing that nanofillers are perfectly connected with matrix material, the effective mechanical parameters of the surface layers are calculated by the mixing law and the Halpin–Tsai model, while those of the core layers are determined by the open-cell scheme. The governing equation of the rotating plate is derived by employing the Hamilton principle.

The paper by Lin et al. [11] analyzes the internal relationship between landslide displacement and rainfall, reservoir water level, and landslide state. The maximum information coefficient (MIC) algorithm is used to calculate the intrinsic correlation between each subsequence of landslide displacement and rainfall, reservoir water level, and landslide state. Subsequences of influential factors with high correlation are selected as input variables of the bidirectional long short-term memory (BiLSTM) model to predict each subsequence. Finally, the predicted results of each of the subsequences are added to obtain the final predicted displacement.

In the paper by Orús-Lacort et al. [12], they demonstrate the Collatz conjecture using the mathematical complete induction method. They show that this conjecture is satisfied for the first values of natural numbers, and in analyzing the sequence generated by odd numbers, they can deduce a formula for the general term of the Collatz sequence for any odd natural number n after several iterations. This formula is used in one case that they analyze using the mathematical complete induction method in the process of demonstrating the conjecture.

The paper by Qian et al. [13] considers the single machine scheduling problem with the due window, delivery time and deteriorating job, whose goal is to minimize the window location, window size, earliness, and tardiness. Common due window and slack due window are considered. The delivery time depends on the actual processing time of past sequences. The actual processing time of the job is an increasing function of the start time. Based on the small perturbation technique and adjacent exchange technique, they obtain the propositions of the problems.

Hao et al. [14] present an unsupervised fault diagnosis methodology to leverage the generated MPCs of different working conditions to diagnose the actual unlabeled MPCs. Firstly, the MPCs of six working conditions are generated with an integrated dynamics mathematical model. Secondly, a framework named mechanism-assisted domain adaptation network (MADAN) is proposed to minimize the distribution discrepancy between the generated and actual MPCs.

In the paper by Wang et al. [15], an adaptive neuro-fuzzy integrated system (ANFIS) for satellite attitude estimation and control was developed. The controller was trained with the data provided by an optimal controller. Furthermore, a pulse modulator was used to generate the right ON/OFF commands of the thruster actuator. To evaluate the performance of the proposed controller in closed-loop simulation, an ANFIS observer was also used to estimate the attitude and angular velocities of the satellite using a magnetometer, sun sensor, and gyro data.

In the paper by Xu et al. [16], an adaptive guided spatial compressive CS (AGSCCS)has been proposed. It mainly aims at improving the section of the local search, which helped enhance the exploitation of AGSCCS. The improvements have been implemented in three steps.

The paper by Ainapure et al. [17] proposes a new cross-domain fault diagnosis method with enhanced robustness. Noisy labels are introduced to significantly increase the generalization ability of the data-driven model. A promising diagnosis performance can be obtained with strong noise interference in testing, as in practical cases with low-quality data.

In the paper by Li et al. [18], an image feature-extracted model based on convolution operation is proposed. Parametric tests and effectiveness research are conducted to evaluate the performance of the proposed model. Theoretical and practical research shows that the image-extracted model has a significant effect on the extraction of image features from traditional engraving graphics because the image brightness processing greatly simplifies the process of image feature extraction, and the convolution operation improves the accuracy.

In the paper by Yu et al. [19], a hybrid adaptive algorithm based on JAYA and differential evolution (HAJAYADE) is developed. The HAJAYADE algorithm consists of adaptive JAYA, adaptive DE, and the chaotic perturbation method. Two adaptive coefficients are introduced in adaptive JAYA to balance the local and global search. In adaptive DE, the Rank/Best/1 mutation operator is put forward to boost the exploration and maintain the exploitation. The chaotic perturbation method is applied to reinforce the local search further.

In the paper by Li et al. [20], the scaling relationships for the dual-rotor system with bolted joints are proposed for predicting the responses of full-scale structure, which are developed by generalized and fundamental equations of substructures (shaft, disk, and bolted joints). Different materials between the prototype and model are considered in the derived scaling relationships. Moreover, the effects of bolted joints on the dual-rotor system are analyzed to demonstrate the necessity for considering bolted joints in the similitude procedure. Furthermore, the dynamic characteristics for different working conditions (low-pressure rotor excitation, high-pressure rotor excitation, two frequency excitations, and counter-rotation) are predicted by the scaled model made of relatively cheap material.

Qian et al. [21] consider a single-machine scheduling problem with past-sequence-dependent delivery times and the truncated sum-of-processing-times-based learning effect. The goal is to minimize the total costs that comprise the number of early jobs, the number of tardy jobs and due dates. The due date is a decision variable. There will be corresponding penalties for jobs that are not completed on time.

Raouf et al. [22] propose an extensive review of the main features of ADAS, the types of faults in each different sensor, and the research efforts related to PHM from the published literature. A detailed discussion of the possible shortcomings and commonly occurring defects is summarized for different ADAS components.

As the Guest Editor, I appreciate that the authors contributed their articles to the Special Issue. I would also like to express my gratitude to all reviewers for their valuable comments for significant improvements to the manuscripts. The goal of this Special Issue was to attract quality and novel papers in the field of "Applied Computing and Artificial

Intelligence". It is hoped that the published papers will be impactful for international scholars in this field and promote further remarkable research in this area.

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