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EDITORIAL

Guest editorial of the special issue 'human-centric, decentralised, and hyper automated cyber-physical systems'

The emergence of affordable communication and computer technologies has brought virtual and physical space closer together in recent years. Cyber-physical systems, which are the outcome of this confluence, have changed the condition of healthcare, medicine, the environment, sustainability, transportation, and energy. Cyber-Physical Systems (CPS) are a synthesis of virtual and physical technologies. As it enables intelligent machines to exert influence on the actuators based on their interaction with the characteristics of the actual world, this technology has caused a spectacular commotion in the technological revolutions. Future digital worlds' behaviours will be governed by the control loops that CPSs build. Through intricate models, CPS specifies the sub-system and its actions. These systems help create social systems since they have humans as a control loop component. Further, control engineering and sensor data are integrated with psychological data to comprehend the human-machine interface better. Additionally, HCPS can be used for next-generation intelligent manufacturing (NGIM). Such NGIM systems increase the efficiency of inherited manufacturing knowledge base and modelling. The knowledge base in these industrial systems consists of both human-provided knowledge and knowledge that cyber systems have acquired through self-learning and cognitive abilities.

This special issue focuses on Improvements in the communication performances and dynamic interactions among the CPS sub-systems that will enable a massive dominance of CPS in the next industrial revolution. Based on the overall response and careful review process conducted 16 papers were accepted for publication. An introduction highlighting the contribution of each accepted papers is given as follows:

In the paper titled as 'Aided Innovative Design of Bathroom Products Based on Artificial Intelligence Technology' the author mainly refers to strengthening the artificial way, so as to combine computer technology with product design. Firstly, the auxiliary innovation of bathroom products based on artificial intelligence technology is proposed, then the user characteristics are analysed, and the auxiliary design framework of bathroom products is designed.

In the next paper titled as 'Attitude Stability Control System of Mobile Robot Mechanism Based on Nano sensor' the researcher has designed a kind of attitude stability control system of mobile robot mechanism based on nano displacement sensor is designed. In the hardware part, a hydraulic drive is used to control the action posture of the mobile robot, a nano displacement sensor is used to collect the walking data of the robot, and serial communication of the upper computer is used to convert the data into electrical signals to realise the robot posture control. In the software part, the mathematical coordinate system of robot walking is constructed, and the rotating posture of the robot is controlled by the Euler angle.

In the next paper 'Influencing Factors of Using Behaviour for Computational Advertising under the Theoretical Model of UTAUT' the author discusses the applicability of the UTAUT theoretical model in computational advertising situations. The performance expectation, effort expectation, and social impact have a positive influence on the acceptance intention of computational advertising; stimulus has no significant influence on the using behaviour of computational advertising; the acceptance intention of computational advertising has a positive influence on the using behaviour of computational advertising.

In the next paper 'Modelling Electric Vehicle Charging station and controlled by Fuzzy Logic Controller for different mode' the authors main objective is to use solar PV array which is interconnected to the battery energy storage systems for charging stations in electric vehicles. The charging station regulates the supply voltage and frequency without the use of a mechanical speed governor. It also assures that energy gained from grid or by the DG set will have the unity power factor (UPF) when the load is nonlinear. Besides this, the Point of Common Coupling (PCC) voltage is synchronised with the grid/generator voltage in order to provide continuous charging

In the next paper 'An Efficient Botnet Detection Approach Based on Feature Learning' This research concentrates on adopting a graph-based feature learning process to reduce feature dimensionality. The incoming samples are correctly classified and optimised using an Adaboost classifier with an improved grey wolf optimiser (g-AGWO). The proposed IGWO optimisation approach is adopted to fulfil the multi-constraint issues related to bot detection and provide better local and global solutions (to satisfy exploration and exploitation.

In the next paper 'A Novel CNN with Gated Recurrent Unit for Automated Speech Emotion Recognition

and Classification' model aims to detect and classify three emotional states of speech such as happy, neutral, and sad. The presented model makes use of CNN-GRU (Convolution neural network – Gated Recurrent unit) based feature extraction technique, which derives a useful set of feature vectors. For classification purposes, a novel deep support vector machine (DSVM) classifier is applied. A comprehensive simulation takes place using the Berlin German Database and SJTU Chinese Database which comprises numerous audio files under a collection of different emotion labels.

In the next paper 'Big Data Analytics for Privacy Through ND-Homomorphic Encryption' the author in this paper uses literature survey of various papers to show classifications, including the Privacy Processes in Big Data and the presentation of the Associate Challenges. Homomorphic encryption is particularised aimed at solitary single action on the enciphered information. Homomorphic enciphering is restrained to an honest operation on the encoded data.

In the next paper 'Enhancing the Energy Efficiency for Prolonging the Network Life Time in Multi-Conditional Multi-Sensor Based WSN' the researcher uses, the type of sensor, number of sensor nodes, deployed in such as manner where the sensors can be used effectively. So, this paper motivated to propose a Multi-Conditional Network Analysis (MCNA) framework for saving the energy level of the sensor nodes by reducing the energy consumption.

In the next paper 'SRN-LEACH: An Energy Efficient LEACH Protocol with Random Number Stabilisation for WSNS' the author proposes a stable random number-based LEACH protocol to stabilise the random number generation to improve the CH selection efficiency. To choose the CHs efficiently, the random number generation is changed and stabilised using the proposed method. The wireless sensor network's average node energy (ANE) is multiplied by the random number that relies on the nodes' energy. To further improve the energy efficiency during the data transmission phase, a node grade algorithm (NGA) based relay selection is introduced for inter and intracluster communication.

In the next paper 'Secure Storage and Accessing the Data in Cloud using Optimised Homomorphic Encryption' the author proposes an efficient data access control using optimised homomorphic encryption. Existing solutions that solely rely on cryptographic technologies to address these security and access control issues result in significant compute complexity for both data owner and cloud service provider.

In the next paper 'Method of Cultivating Employability of Computer Majors in Colleges and Universities Based on Data Mining' the author analyses about the Employability as a set of achievements—skills, understandings, and personal attributes—that makes graduate students more going to benefit from work opportunities and be productive in the workplace, which rewards themselves, the working population, the community, and the economy.

In the next paper 'Prediction of the high-quality development level of inbound tourism based on adaptive neural network technology' analyses a networking class called adaptive neural networks (ANN) is used in dynamic tourism situations. Many methods are used to make neural networks flexible: weight adjustment, changes in neuronal characteristics, and changes in the network's structural composition.

In the next paper 'ETP-AKEP: Enhanced Three Party Authenticated Key Exchange Protocols For Data Integrity In Cloud Environments' the researcher deals with key exchange protocols to generate a secure session key exchanged between two remote users and servers in order to ensure security between users. Furthermore, an Enhanced three-party authenticated key exchange protocols (ETP-AKE) protocol that does not depend on symmetric key encryption and instead uses asymmetric key encryption.

In the next paper 'Multi Objective Optimisation Method Collision Safety Networked Vehicles Based on Improved Particle Swarm Optimisation' the author analyses crashworthiness and energy absorption optimisation of automobile structure is an important research content of modern automobile industry. Based on improved particle swarm optimisation optimal solution of multi-objective parameters of vehicle structure crashworthiness problem, a multi-objective optimisation method of vehicle crash safety is improved.

We want to thank all the authors for their exemplary hard work while writing these articles and the effort they have made to modify them based on the reviewer's comments. Further, the work done by the authors in this special issue is genuine, and also the response received from the scientific community is significant. Finally, we thank the Editor-in-Chief's guidance and support for allowing us to edit this special issue in this reputed journal.

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