
Editorial

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Currently, the digital revolution has begun, and high-performance computing (HPC) is at the forefront. As the evolution of HPC has made the computation faster and easier than on-premises, business organisations require to accommodate it to remain competitive. Further, the demand to process the big data resources has reached double the capacity of parallel and distributed systems in the last decades. To accelerate conventional computing

platforms with HPC and meet changes in growing big data requirements we need high performance computing.

This special issue helps to explore advanced tools and techniques for multi-core and many-core systems in an appropriate way to unlocks the potential of HPC so that end-users can access its capacity to complete. Multi-core and many-core systems execute tasks on an independent execution core in a concurrent manner. Besides, multi-core

and many-core systems are now applied across a wide range of computation problems and across industries to solve large-scale computational problems in a timely and efficient manner. Some of its typical advantages include reduced time delay, improved performance, reliability, robustness, system efficiency, and lesser computation power requirements. This special issue contains seven peer-reviewed papers covering the topic explicitly.

In the paper titled as ‘Evaluation of flexural and shear property of high performance PLA/Bz composite filament printed at different FDM parametric conditions’ by P. Sneha et al. The researchers analyse about polylactic acid matrix (PLA) particularly for 3D printing. Here researcher applies 14% bronze (Bz) with a particle size of 10–20 μm for reinforcement in the PLA matrix to obtain a composite 3D filament. The density, bending and shear properties of are evaluated according to ASTM standards. Fracture mechanics are analysed through Scanning Electron Microscopy (SEM) and 3D optical microscopy.

The next paper named as ‘Pervasive hybrid two-stage fusion model of intelligent wireless network security threat perception’ by Feilu Hang et al. The author of this paper has introduced a pervasive hybrid two-stage fusion model (PHTSFM) for the cybersecurity situation evaluation and has focused on multi-heterogeneous sensors to determine the impact of security threats on a networked system. To analyse multisource information’s characteristics network security analysis and data fusion security algorithms have been used. The simulated network assessment is appropriate for the network environment, and is precise and effective.

The following paper titled as ‘Network security defence system based on artificial intelligence and big data technology’ by Linjiang Xie et al. Here the researchers’ has proposed a Big Data Analytics based security system (BDASS) to improve the communication network’s security defense system with artificial intelligence. The big data sets representing multiple categories of data are used in big data analysis methods. Artificial intelligence offers algorithms that can think or learn and strengthen their behaviour. This technique is employed to predict, identify, define, and resolve security risks, cybersecurity of communication networks.

The subsequent paper entitled as ‘Optimised embedded sensor network using multicore architecture for low power application’ by Peng Li et al. The author proposes a novel MCA-LPA technique that includes robust learning device optimisation for switching frequency. The multi-core architecture for low power application MCA-LPA model architecture consists of various steps in developing, classification, and automating workloads using BAT equations for intense and profound learning predictions has considerable impact on energy management in embedded sensor network.

The following paper named as ‘Reconfigurable architecture for heterogeneous multi-core and many-core architecture with IoT assistance’ by Xuefeng Xing et al. The author has proposed a heterogeneous multi-core

architecture (RA-HMCA) framework to simplify program by preventing redundancies from being introduced and decrease the risk of threats. The author has employed multi-integer linear programming (MILP) technology to scan viable task model. An optically reconfigurable POSIX-based program is used to interface Unix operating system.

The next paper named as ‘Knowledge-based mining with the game-theoretic rough set approach to handling inconsistent healthcare data’ by Abhay Kumar Singh and Muhammad Rukunuddin Ghalib. The author focuses on developing knowledge-based mining with a game-theoretic rough set (KM-GTRS) for healthcare data analysis process. The knowledge mining process is able to handle high-dimensional data and providing enough application-centric services. The machine learning and intelligent techniques are introduced in the healthcare data analysis to improve data processing. This method also ensures medical data analysis in minimum time.

The final paper titled as ‘Multi-modal information interaction and fusion for the parallel computing system using AI techniques’ by Yang Li et al. The author has proposed a novel Multi-modal Fusion-based Parallel Computing (MMFPC) Model. Feature extraction using GLCM and HOG features is performed. Classification is analysed using different artificial intelligence algorithms. It is observed that the proposed system increases the reliability of recognition systems.

This special issue offers the researchers an opportunity to better understand the possibilities of multi-core and many-core systems in the coming decade and the possibility of innovating emerging tools and paradigms. Further, the key objective of this issue is to explore more advanced techniques, algorithms, programming models, methodologies, and frameworks for multi-core and many-core systems in the context of HPC. The work done by the authors in this special issue is genuine and also the response received from the scientific community is significant. It is hoped that this special issue will positively provide a direction. Also, to facilitate further research on, this special issue welcomes interdisciplinary researchers to present novel and innovative solutions that fall into the scope of this special issue. Further all the papers that are approved for publication have undergone a keen examination and review process to meet the standards of the journal.

We would like to thank all the authors for the exemplary hard work they have done while writing these papers and effort they have made to modify them based on reviewer’s comments. Finally, we thank the Editor-in-Chief’s guidance and support for offering us the privilege to edit this special issue in this reputed journal.