S.I.: "Quantum Inspired Neural Networks for Engineering Optimization"

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Neural networks (NNs) represent a very important field in computational intelligence, soft computing, and optimization in a general sense. For this purpose, we noticed clearly that they attracted outstanding interest from many researchers across the globe. Indeed, past, and ongoing research in this field covers an important group of subjects, from basic research to many real-world applications. On the other hand, many research efforts in the field on quantum computing have been made since 1990, after the demonstration that computer based on principle of quantum mechanics can offer more processing power for some classes of problems. Typically, quantum computing is based on the principle of superposition, which states that a particle can be in two different states simultaneously, suggest that a high degree of parallelism can be achieved using this kind of computers. The superiority of quantum computing was demonstrated with few algorithms, namely the Shor's algorithm (used for factoring large number) and Grover's algorithm (used for searching databases). The integration of neural networks and quantum computing has become topic of increasing interest for both researchers and practitioners from academic fields and industry world-wide. It is foreseeable that quantum inspired neural networks (QINNs) will be one of the main approaches for the next generation of intelligent system and optimization research. In recent years, NNs along with quantum computing has become a new hotspot of intelligent computing research. The combined package of QINNs have demonstrated great benefits to industry and showed potential to be used in a wide variety of applications. Hence, the interest of researchers bends towards the recent development of NNs that are inspired by quantum computing for different applications. The principle aim of this special issue was to assemble state-of-the-art contributions on the latest research and development, up-to-date issues, and challenges in the field of QINNs for solving industrial optimization problems. The following articles in this special issue have introduced a variety of NNs and Hybrid methods for advancement of technologies for solving engineering problems.

The article entitled "*Hybrid Optimization Algorithms for Resource Allocation in Heterogeneous Cognitive Radio Networks*" has analysed a framework (in the presence and absence of the prime users) to maximize the capacity and data rate of the network. Authors have integrated a hybrid optimization algorithm for decision making. Results reported in this article revealed that best solution was achieved by considering capacity, spectrum sharing, data rate and interference for user's subordinate in the entire network.

The article entitled "*Securing Blockchain Transactions Using Quantum Teleportation and Quantum Digital Signature*" has proposed an algorithm for secure transactions on the blockchain network integrated with quantum digital signature (QDS) and quantum

teleportation phenomenon of quantum computing. The proposed algorithm considers key pairs to generate private keys and their corresponding public keys. Here, quantum digital signatures were used to sign the message which were then distributed over the blockchain network using the teleportation phenomenon. The Einstein–Podolsky–Rosen (EPR) pair of particles was used to communicate the quantum information via a quantum channel for teleportation, which was generated by operating Bell measurements with corresponding EPR pairs. The original state of the particle (sender) was destroyed once the information was transported to the other particle (receiver) and the QDS scheme also validates the qubits received. Authors conducted twofold validation to demonstrate high-level security in the transactions.

The article entitled "*DRFS: Detecting Risk Factor of Stroke Disease from Social Media Using Machine Learning Techniques*" has proposed a DRFS methodology to determine various symptoms associated with stroke disease and suggested preventive measures of stroke disease from the social media content. Authors have presented an architecture for clustering tweets depending upon the content using spectral clustering. Experiments were performed to evaluate the performance of the proposed DRFS methodology. Results demonstrate that the DRFS system was capable to suggest preventing measures for high and low risk factors for stroke diseases.