
Editorial

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Biographical notes: Srikanta Patnaik is a Professor in the Department of Computer Science and Engineering, SOA University, Bhubaneswar, India. He received his PhD (Engineering) in Machine Intelligence from the Jadavpur University in 1999 and supervised 12 PhD theses and more than 30 MTech theses in the area of machine intelligence, soft computing applications and reengineering. He is the Editor-in-Chief of *International Journal of Information and Communication Technology* and *International Journal of Computational Vision and Robotics* published from Inderscience Publishing House, England and also Editor-in-Chief of Book Series on *Modeling and Optimization in Science and Technology* published from Springer, Germany.

An agent-based system is a new paradigm for conceptualisation, design, and implementation of intelligent software systems. A multi-agent system is a loosely coupled network of agents which work together to solve problems that are beyond the capabilities of individual agents. The agents are autonomous, and may be heterogeneous in nature. The intersection between computational intelligence and multi-agent technology opens new significant scenarios in many fields where the representation and management of complex systems play a fundamental role. The role of uncertainty becomes crucial, for an efficient and coherent resolution of complex problems, in the formulation of intelligent agent-based systems. During recent years, there has been a growing awareness that computational intelligence-based handling of uncertainty in agents is equally important as the other features of agent paradigm. Computational intelligence techniques, including fuzzy sets, neural networks, evolutionary algorithms, and their hybridisations, can be successfully applied to agent systems for solving real world complex problems. These intelligent multi-agent systems are able to solve problems that are beyond the capabilities of individual agents, mainly because of their collective intelligence.

The objective of this special issue is to provide an opportunity to the researchers who are working in the area of theory and applications of computational intelligence and multi agent system. This special issue covers 11 articles from various research laboratories across the globe.

The first paper entitled 'A survey on machine learning techniques used for software quality prediction' by Saumendra Pattnaik and Binod Kumar Pattanayak presented a survey on various machine learning used for software quality prediction along with an analytic justification of each of the proposed solutions.

In the second paper entitled 'Optimisation of motion cueing position based on adaptive chaos PSO algorithm' by Xiang-Tong Kong et al. proposed an improved adaptive chaos particle swarm optimisation (ACPSO) algorithm for modelling a flight simulator, choosing the optimal motion cueing position. They have shown that the ACPSO algorithm improves the overall optimisation effect of the optimal position problem.

The next paper entitled 'Coalition utility allocation based on agent's outstanding characteristics' by Yiqin Cao et al. proposed a novel coalition utility allocation strategy based on belief desire and intention (BDI) model, through updating agents' outstanding characteristics.

The paper entitled 'A fractional variation estimation algorithm for smart road traffic control network' by Zhichao Wang et al. proposed a novel fractional dimension derivation along with the estimation algorithm, which involves the fractional variation definitions with respect to the prediction of the vehicle speed, and are used to warn upcoming collisions between cars or with pedestrians.

The paper entitled 'Research on CDN network architecture design and safety protection for power grid' by Chun Guang Zhang et al. has proposed a novel CDN network architecture for power grid, which has the power grid characteristics and meets the power grid requirements

The paper entitled 'The system of protecting eyes and saving energy based on Android' by Zhenghua Xin et al. has proposed a design, to make the screen enhance the screen brightness under the lighter conditions automatically and in the darker environment, it can reduce the screen brightness accordingly, so that users can have the more comfortable visual effect for protecting the eyesight, simultaneously reduces the unnecessary energy consumption.

The paper entitled ‘A new method of applying the ETC technology to the underground parking lot in the supermarket’ by Zhenghua Xin and Guolong Chen proposed a method for pay the parking fee in the parking area using RFID technology.

The paper entitled ‘Design of multi-agent-based online auction in mobile environment’ by Hongyan Yu et al. has presented the design of an online auction app to simulate the processes of mobile auction.

The next paper entitled ‘Secure social multimedia content distribution based on social network analysis’ by Conghuan Ye et al. proposed a new desynchronisation fingerprinting utilising the random grid templates to produce desynchronised copies. They have presented the experimental results which shows that the average collusion can produce collude copy with low cost and the visual quality does not improve with the increase of the number of copies.

The paper entitled ‘The property of agent’s sacrifice: definition, measure, effect and applications’ by Viacheslav Abrosimov presented the situations when an agent fulfilling a collective task in a multi-agent system performs actions inconsistent with its further functioning. The author has also proposed a modified version of belief-desire-intention architecture of multi-agent systems by adding the notion of the agent’s ‘commitment’ to a group and the emotion of the agent’s sacrifice.

Last but not least, the paper entitled ‘Performance evaluation and analysis of lightweight symmetric encryption algorithms for internet of things’ by Yue Li and Yanqin Cao presented the performance evaluation and analysis on some representative lightweight encryption algorithms in terms of computational efficiency and memory usage.

I must thank all the paper contributors of this special issue and I am sure that the readers shall gain maximum out of these papers.