

Guest Editorial on the Special Section on Bio-Inspired Control Theory and Applications

What is the vision of the Convergence of Bioscience and Information Technologies? Scientists probe Nature closer than ever before making an information deluge that if managed with computer power will deliver a deep understanding of Nature. Bio-inspired Computation and Bio-mimetic exploit the insight to thrive with real problems that life solved in its history. Understanding of information processing in biological systems is key to the 'Bio-ICT convergence', e.g., novel computing paradigms derive from the information representation and processing capabilities of biological systems or from the computational interpretation of biological processes. Materials Science people also use the knowledge to create new biosensors, immune sensors and Bio-MEMS. The Bio-ICT convergence is hugely powerful but successful only when you participate and present your field of expertise: automatic control theory, cell biology, mathematics, computational science, physics, chemistry or medicine. A fusion of knowledge builds to create new industries in areas as disparate as humanoid robotics, computer science, synthetic biotechnology, and biomedicine.

Bio-Inspired Control Theory and Applications which is one of the most important and promising area in the Bio-ICT convergence technologies will provide an opportunity for academic and industry professionals to discuss the latest issues and progress in the area of the combination of Computational and Control Technology with the Biosciences. This special issue aims at exhibiting the latest research achievement, findings and ideas in the areas of Bio-Inspired Control Theory, Systems, and applications. The papers published in this special issue represent some of the best current researches in the area of Bio-Inspired Control Theory and Applications. We have 37 papers submitted from various countries Europe, America, Japan, China, etc. Only 10 papers are qualified with peer-reviewing process and published due to the limited space.

Five of the selected papers are published in this special issue and briefly described in the followings: the first paper presents a user identification method at H.264 streaming using watermarking with fingerprints; the second one applies a set of invariant moment features and a nonlinear Back Propagation Neural Network (BPNN) verifier for a fingerprint verification system; the third one explores the evolutionary process of source codes regarding that the plagiarism procedure can be considered as an evolutionary steps of source codes with the final goal of reconstruction of a tree depicting the evolution process in the source code; the fourth one describes a method calculating the ratio of the standard deviation (STD) of the noisy power spectrum in the time-frequency bin to its normalized time-frequency average (NTFA); the last paper aims to overcome the significant challenge of an eye-location that is able to maintain high accuracy by disregarding highly variable changes in the environment.

Next five papers will be published in the following issue: the first paper addresses a genetic algorithm with dynamic variable number of Individuals and accuracy; the second paper describes a bioinformatics based approach to user authentication via keystroke dynamics; the third paper applies a neural network based biometric personal Identification; the fourth paper proposes a solution for perceptual artifacts caused by network delays which is more important criteria rather than degradation of task performance; the last paper develops an evolutionary classifier fusion method for optimizing face recognition.

Finally, I would like to thank the Editorial Board of the IJCAS, especially for their trust and support, and all the authors and reviewers for their invaluable contributions in making this successful special section. I hope that this special section will be a trigger for further related research and technology developments in this important subject.

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