



Editorial

Poonam Yadav¹

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Thank you for giving me this opportunity to act as the Guest Editor of this special issue, which is on nature-inspired algorithms for high-performance computing in computer vision. To tackle complex real-world problems, scientists have been looking into natural processes and creatures—both as models and metaphors—for years. Optimization is at the heart of many natural processes including Darwinian evolution, social group behavior, and foraging strategies. Over the last few decades, there has been remarkable growth in the field of nature-inspired search and optimization algorithms. Nature-Inspired Algorithms provides a systematic introduction to all major nature-inspired optimization algorithms for optimization. Currently, these techniques are applied to a variety of problems, ranging from scientific research to industry and commerce. The two main families of algorithms that primarily constitute this field today are the evolutionary computing methods and the swarm intelligence algorithms. Although both families of algorithms are generally dedicated to solving search and optimization problems, they are certainly not equivalent, and each has its own distinguishing features. Reinforcing each other's performance makes powerful hybrid algorithms capable of solving many intractable search and optimization problems. Many problems in science and engineering can be formulated as optimization problems, subject to complex nonlinear constraints. The solutions to highly nonlinear problems usually require sophisticated optimization algorithms, and traditional algorithms may struggle to deal with such problems.

Evolutionary computation offers powerful problem-solving methodologies inspired by models of natural genetics and evolutionary processes. Potential applications are

wide-ranging and include problems from combinatorial optimization, numerical optimization, multi-objective optimization, and others and specific applications of these problems in diverse domains, such as engineering, design, medicine, robotics, science, etc. Techniques from evolutionary computation often lend themselves well to parallel and distributed implementations and are often more effective in dealing with challenging problem characteristics such as non-linearity and high-dimensionality than alternative approaches.

This issue targets high-quality original research papers covering all aspects of evolutionary computing. Additionally, this issue unified approach, balancing algorithm introduction, theoretical background, and practical implementation, complements extensive literature with well-chosen case studies to illustrate how these algorithms work. The Applications of nature-inspired optimization algorithms: digital filter designing, Evolutionary computing, fuzzy systems, swarm intelligence, Image processing, classifier system, Machine-learning, Digital integrator, and differentiator designing, Face-recognition, Hybridization of Algorithms, Memetic Computing, Multi-objective, Systems and Control, Robotics, Power Systems, Future Computing Devices, Large-scale Optimization, and Artificial neural networks. This issue contributes to describing new techniques, novel data representations, and evaluation criteria, as well as papers dealing with specific case studies.

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✉ Poonam Yadav
poonam.y2002@gmail.com

¹ DAV College of Engineering and Technology, Kanina,
Mahendergarh, Haryana, India