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Nature inspired clustering algorithms for analysis of natural databases

Satyasai Jagannath Nanda

Malaviya National Institute of Technology Jaipur, India

Data Clustering concept started with K-means algorithm which was reported around 1957. After more than 50 years of its existence the algorithm is still popular and widely used for partitioning large database. The 1990 kick started a revolution in the area of clustering with the use of nature inspired meta-heuristics. The nature inspired techniques are also popularly known as artificial intelligence (AI) mechanisms. With this a new set of algorithms like Genetic Algorithm, Particle Swarm Optimization, Ant Colony Optimization, Differential Evolution, Artificial Immune Systems, Bacterial Foraging Optimization are evolved which are being used for cluster analysis. The beauty of these algorithms are, they employ a set of naturally driven particles (which represent potential solutions of a problem) to explore the search space and assure greater probability to achieve global solutions. They overcome the local optima solutions by using collaborative learning, where the traditional derivative based algorithms like K-means, K-nearest neighbor failed. Present research focus on the development of multi-objective and constrained approaches in the nature inspired clustering. These set of complex algorithms have the potential to accurately analyze databases derived from natural phenomenon like earthquakes, volcanic eruptions, and seismic sea waves like Tsunami. Timely use of the derived results can able to save a mass population of a geographic region from the natural hazards.

Biography

Satyasai Jagannath Nanda has completed his PhD at the age of 28 years from School of Electrical Sciences, Indian Institute of Technology Bhubaneswar. Prior to this he has received the MTech degree in Electronics and Communication Engineering from National Institute of Technology, Rourkela and BE from Biju Patnaik University of Technology, Odisha. He is presently working as an Assistant Professor in the Department of Electronics and Communication Engg., MNIT Jaipur. During the PhD he was awarded the GESP Research Fellowship by Dept. of Foreign Affairs and International Trade, Govt. of Canada in the Dept. of Earth Sciences, University of Western Ontario, Canada. He has published 6 papers in international journals and 11 papers in the IEEE conference proceedings. Within a short time span his papers have received 57 citations with H-index 5 and I-10 index 1. He has been serving as constant reviewer of IEEE transactions on Data and Knowledge Engineering, Elsevier's Swarm and Evolutionary Computation, Applied Soft Computing, Swarm and Evolutionary Computation, Information Sciences.

nanda.satyasai@gmail.com

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