RGAP: A Rough Set, Genetic Algorithm and Particle Swarm Optimization based Feature Selection Approach

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Abstract

Feature selection plays an important role in improving the classification accuracy by handling redundant or irrelevant features present in the dataset. Various soft computing based hybrid approaches like neuro-fuzzy, genetic-fuzzy, rough set-neuro etc. are proposed by researchers to perform feature selection. The existing approaches gives higher complexity and computational cost with low classification accuracy. Hence to improve the complexity and classification accuracy, a hybrid approach based on Genetic Algorithm (GA), Particle Swarm Optimization (PSO) and Rough Set Theory (RST) to perform feature selection is proposed. In the proposed approach, GA is used as a searching algorithm. To explore search space more efficiently, GA is combined with a PSO based local search operation. Rough Set Attribute Reduction (RSAR) method based on RST is used to compute core reducts. The proposed algorithm is tested on various benchmark datasets. Satisfactory improvements in terms of complexity and classification accuracy have been achieved.

References


Index Terms

Computer Science  Algorithms
Keywords

Feature Selection, Particle Swarm Optimization, Genetic Algorithm, Rough Set Theory.