Artificial Reproduction System and Imbalanced Dataset: A Mendelian Classification

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Abstract : We propose a new evolutionary computational model called Artificial Reproduction System which is based on the complex process of meiotic reproduction occurring between male and female cells of the living organisms. Artificial Reproduction System is an attempt towards a new computational intelligence approach inspired by the theoretical reproduction mechanism, observed reproduction functions, principles and mechanisms. A reproductive organism is programmed by genes and can be viewed as an automaton, mapping and reducing so as to create copies of those genes in its off springs. In Artificial Reproduction System, the binding mechanism between male and female cells is studied, parameters are chosen and a network is constructed also a feedback system for self regularization is established. The model then applies Mendel's law of inheritance, allele-allele associations and can be used to perform data analysis of imbalanced data, multivariate, multiclass and big data. In the experimental study Artificial Reproduction System is compared with other state of the art classifiers like SVM, Radial Basis Function, neural networks, K-Nearest Neighbor for some benchmark datasets and comparison results indicates a good performance.

Keywords : bio-inspired computation, nature- inspired computation, natural computing, data mining

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