A new class of dynamical systems with applications to global optimization

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Abstract

In this paper we introduce a new method for mathematical modelling of dynamical systems. This method describes relationships between each pair of variables in the form of the influence of the change of one variable on the change of the other variable. We apply this approach to global optimization problems, where the influences between a given objective function and its variables are used for the search of a descent direction from a particular point. A new algorithm for solving continuous global optimization problems is developed. Different methods for the calculation of influences are examined.