

Providing a Diagnosis System based on Hybrid Approach of Artificial Immune System and Velocity Bounded Boolean Particle Swarm Optimization Algorithm

Vahide Mansoori, Malihe Hashemipour

Department of Computer Engineering, Faculty of Science, Kerman Branch, Islamic Azad University, Kerman, Iran

Abstract

One of the practical usages of data mining is design of intelligent medical diagnostic systems. The most important challenge in designing such systems is increasing detection accuracy; therefore this paper is proposed with the aim of increasing the detection accuracy. In this paper an intelligent diagnosis system is presented by using a hybrid approach of artificial immune system algorithm and velocity bounded boolean particle swarm optimization approach. In the proposed system, firstly, most informative features are detected by using the velocity bounded boolean particle swarm optimization algorithm, and then the classification of disease is done by using the artificial immune system algorithm according to the values of detected features. UCI medical datasets are used for evaluating the proposed approach; also, 5-fold cross validation with 10 repeats is used for more accurate evaluation of the proposed approach. Simulation results shows that the approaches based on artificial immune system have a good ability in modeling medical data and can yield acceptable classification accuracy. Furthermore, the proposed approach significantly improves the classification accuracy due to the use of feature selection algorithm based on velocity bounded boolean particle swarm optimization algorithm.

Keywords: diagnosis, artificial immune system algorithm, boolean particle swarm optimization algorithm, feature selection, k-fold cross validation.