Intruder Detection System

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Abstract: *In the era of big data, with the increasing number of audit data features, **human-centred smart intrusion detection system (IDS)** performance is decreasing in training time and classification accuracy, and many SVM-based intrusion detection algorithms have been widely used to identify an intrusion quickly and accurately. This paper proposes the FWP-SVM-GA (feature selection, weight, and parameter optimization of support vector machine based on the genetic algorithm) algorithm based on the characteristics of the genetic algorithm (GA) and the **support vector machine (SVM)** algorithm. The algorithm first optimizes the crossover probability and mutation probability of GA according to the population evolution algebra and fitness value; then, it subsequently uses a feature selection method based on the genetic algorithm with an innovation in the fitness function that decreases the SVM error rate and increases the true positive rate. Finally, according to the optimal feature subset, the feature weights and parameters of SVM are simultaneously optimized. The simulation results show that the algorithm accelerates the algorithm convergence, increases the true positive rate, decreases the error rate, and shortens the classification time. Compared with other SVM- based intrusion detection algorithms, the detection rate is higher and the false positive and false negative rates are lower.*

Keywords: Human-centred smart intrusion detection system, support vector machine (SVM)

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