Abstract

Network and system security is of vital importance in the present data communication environment. Hackers and intruders can create many successful attempts to cause the crash of the networks and web services by unauthorized intrusion. New threats and associated solutions to prevent these threats are emerging together with the secured system evolution. Intrusion Detection Systems (IDS) are one of these solutions. The main function of Intrusion Detection System is to protect the resources from threats. It analyzes and predicts the behaviours of users, and then these behaviours will be considered an attack or a normal behaviour. There are several techniques which exist at present to provide more security to the network, but most of these techniques are static. On the other hand, intrusion detection is a dynamic one, which can give dynamic protection to the network security by observing the attack. In recent times, Extreme Learning Machine (ELM) has been extensively applied to provide potential solutions for the IDS problem. But, the practicability of ELM is affected because of the complexity in choosing the suitable ELM parameters. Hence, in this paper sigma (σ) of the radial basis kernel function is tuned using Levenberg-Marquardt (LM) learning and proposed kernelized Extreme Learning Machine with LM. In order to obtain a converged solution, LM learning is utilized. The experiment is carried out with the help of WEKA by using KDD Cup 1999 dataset and the results indicate that the proposed technique can achieve higher
Kernelized Extreme Learning Machine with Levenberg-Marquardt Learning Approach towards Intrusion Detection

detection rate, very low false alarm rate and to achieve high accuracy than the regular ELM algorithms. This method is used to decrease the space density of the data.

References


**Index Terms**

Computer Science

Information Security

**Keywords**

- Intrusion Detection System (IDS)
- Extreme Learning Machine (ELM)
- Radial Basis Function (RBF)
- Kernel Function
- Leave-One-Out (LOO)
- Kernel Partial Least Squares (K-PLS)