A hybrid particle swarm optimization - extreme learning machine approach for intrusion detection system

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ABSTRACT
There are several limitations that facing intrusion-detection system in current days, such as high rates of false positive alerts, low detection rates of rare but dangerous attacks. Daily, there are reports of incidents such as major ex-filtration of data for the purposes of stealing identities. Hybrid model's approaches have been widely used to increase the effectiveness of intrusion-detection platforms. This work proposes the extreme learning machine (ELM) is one of the poplar machine learning algorithms which, easy to implement with excellent learning performance characteristics. However, the internal power parameters (weight and basis) of ELM are initialized at random, causing the algorithm to be unstable. The Particle swarm optimization (PSO) is a well-known meta-heuristic which is used in this research to optimize the ELM. Our propose model has been apple based as intrusion detection and validated based on NSL-KDD data set. Our developed model has been compared against a basic ELM. PSO-ELM has outperformed a basic model in the testing accuracy.

KEYWORDS
Intrusion detection system; Extreme learning machine; Particle swarm optimization; NSL-KDD; Hybrid