Thesis Title	Fuzzy Genetic Algorithm for Real-Time Intrusion Detection System
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Candidate	Miss Pawita Jongsuebsuk
Thesis Advisor	Assoc. Prof. Dr. Naruemon Wattanapongsakorn
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Abstract

Internet has become one of the main communication modes in our society. Various types of internet applications and usage are available. Increasing usage of the internet also increases threats in the internet. To prevent unwanted or dangerous threats, we have to be able to detect them first. Therefore, designing an effective intrusion detection system is a challenge because the threats have different characteristics and they evolve every day. The intrusion detection at present must be robust for new or unknown attacks. In this thesis, a real-time network-based intrusion detection approach using fuzzy genetic algorithm is proposed to detect DoS attacks and Probe attacks. The detection accuracy of the fuzzy genetic algorithm with KDD99 dataset and current online dataset is demonstrated. The experimental results show that the fuzzy genetic technique gives high detection rates and is robust for both known and unknown attacks. Then, the fuzzy genetic algorithm technique for real-time and online intrusion detection, i.e., the data is detected right after it arrived to the detection system, is developed. In an actual network environment, the network traffic is preprocessed into 12 features by counting connections in each source-destination IP-pair within 2 second time interval. The IDS is evaluated in terms of the detection speed, CPU consumption, memory consumption, the false alarm rate and the detection rate.

Keywords: Fuzzy Genetic Algorithm/ Intrusion Detection System/ Dos Detection/
Probe Detection