

# Comparing and Analyzing Applications of Intelligent Techniques in Cyberattack Detection

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## **Abstract**

Now a day's advancement in technology increases the use of automation, mobility, smart devices, and application over the Internet that can create serious problems for protection and the privacy of digital data and raised the global security issues. Therefore, the necessity of intelligent systems or techniques can prevent and protect the data over the network. Cyberattack is the most prominent problem of cybersecurity and now a challenging area of research for scientists and researchers. These attacks may destroy data, system, and resources and sometimes may damage the whole network. Previously numerous traditional techniques were used for the detection and mitigation of cyberattack, but the techniques are not efficient for new attacks. Today's machine learning and metaheuristic techniques are popularly applied in different areas to achieve efficient computation and fast processing of complex data of the network. This paper is discussing the improvements and enhancement of security models, frameworks for the detection of cyberattacks, and prevention by using different machine learning and optimization techniques in the domain of cybersecurity. This paper is focused on the literature of different metaheuristic algorithms for optimal feature selection and machine learning techniques for the classification of attacks, and some of the prominent algorithms such as GA, evolutionary, PSO, machine learning, and others are discussed in detail. This study provides descriptions and tutorials that can be referred from various literature citations, references, or latest research papers. The techniques discussed are efficiently applied with high performance for detection, mitigation, and identification of cyberattacks and provide a security mechanism over the network. Hence, this survey presents the description of various existing intelligent techniques, attack datasets, different observations, and comparative studies in detail. © 2021 Priyanka Dixit et al.