

## Applications of AI, Machine Learning, and Deep Learning in Cyber Security

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**Abstract :** Deep learning is increasingly used as a building block of security systems. However, neural networks are hard to interpret and typically solid to the practitioner. This paper presents a detail survey of computing methods in cyber security, and analyzes the prospects of enhancing the cyber security capabilities by suggests that of accelerating the intelligence of the security systems. There are many AI-based applications used in industrial scenarios such as Internet of Things (IoT), smart grids, and edge computing. Machine learning technologies require a training process which introduces the protection problems in the training data and algorithms. We present machine learning techniques currently applied to the detection of intrusion, malware, and spam. Our conclusions are based on an extensive review of the literature as well as on experiments performed on real enterprise systems and network traffic. We conclude that problems can be solved successfully only when methods of artificial intelligence are being used besides human experts or operators.

**Keywords :** artificial intelligence, machine learning, deep learning, cyber security, big data

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