Abstract

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Deep Learning for Intrusion Detection

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Abstract

Intrusion detection has been widely studied in both industry and academia, but cybersecurity analysts always want more accuracy and global threat analysis to secure their systems in cyberspace. Big data represents the great challenge of intrusion detection systems, making it hard to monitor and analyze this large volume of data using traditional techniques. Recently, deep learning has been emerged as a new approach which enables the use of Big Data with a low training time and high accuracy rate.

This contribution proposes an approach of an IDS based on cloud computing and the integration of big data and deep learning techniques to detect different attacks as early as possible. To demonstrate the efficacy of this system, the proposed system is implemented within Microsoft Azure Cloud, as it provides both processing power and storage capabilities, using a convolutional neural network (CNN–IDS) with the distributed computing environment Apache Spark, integrated with Keras Deep Learning Library.

The proposed approach includes the pre-processing of data and deep learning. The experimental results show effectiveness of the approach in terms of accuracy and detection rate due to the integration of deep learning technique and Apache Spark engine.

Key words: Deep Learning, Intrusion Detection, Big Data, Apache Spark, Microsoft Azure Cloud

Biography

Farah JEMILI received the Engineer degree in Computer Science in 2002 and the Ph.D degree in 2010. She is currently Assistant Professor at Higher Institute of Computer Science and Telecom of Hammam Sousse (ISITCOM), University of Sousse, Tunisia. She is a senior Researcher at MARS Laboratory (ISITCOM –Tunisia). Her research interests include Artificial Intelligence, Cyber Security, Big Data Analysis, Cloud Computing and Distributed Systems. She served as reviewer for many international conferences and journals. She has many publications; 6 book chapters, 5 journal publications and more than 15 conference papers.