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Artificial intelligence for improving the performance of computer networks

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Abstract

Optimizing a network means improving its functioning in terms of security and reliability, performance and speed, quality of service (Qos) and of course in terms of energy consumption. Network architectures are increasingly managed in a centralized structure with management functions handled in a control plan separate from data plan, such as in cloud-managed networks and Software Defined Networking (SDN). Artificial Intelligence (AI) and machine learning are essential to collect the full benefits of these centrally managed network architectures.

AI and machine learning are now used to continuously analyse large amounts of data using sophisticated algorithms to determine what exactly is happening on the network, to make predictions and to react to events gradually as they occur. This ability to intelligently analyse network data and to derive detailed insights into network performance without human intervention is at the heart of its attraction. The combination of AI and centralized software networking is pushing us towards fully automated networking. AI can also provide a contribution in the field of cybersecurity, allowing real-time visualization of threats. It makes it possible to correlate a certain amount of information that a human expert is no longer able to do. In addition, AI techniques can be used as an attack simulation tool in the detection of vulnerability or for guessing passwords in order to detect computer network failures or data in order to improve and strengthen its security.

Key words: Computer networks, vulnerability, centralized network management, machine learning, artificial intelligence.

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