

A Critical Analysis of the Blockchain Technology and its Applications

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Abstract—Artificial intelligence is a branch of computer science and further machine learning is a subpart of artificial intelligence. Machine learning (ML) is a sort of artificial intelligence (AI) that enables software programs to improve their prediction accuracy without being expressly designed to do so. Machine learning is significant because it enables businesses to see changes in customer behavior and company operating practices while also assisting in the creation of new goods. In recent years, blockchain technology has become increasingly popular. Individuals can interact directly with each other through a highly secure and decentralized system, without the need for a middleman, thanks to this technology. Machine learning, in addition to its strengths, may assist in overcoming many of the restrictions that blockchain-based systems face. These two technologies when combined can produce high-performing and valuable solutions. In this manuscript, blockchain technology and how machine learning skills can be combined with a blockchain-based system are studied. Moreover, a few of the most common applications and use cases for this integrated strategy are discussed.

Keywords: Blockchain Technology, Artificial Intelligence, Machine Learning, Supervised Learning, Unsupervised Learning, Cryptocurrency.

I. INTRODUCTION

A. Blockchain

Because of the decentralized system, blockchain provides a highly securing environment with the help of a smart contract program and hashing power. Machine-learning algorithms can do the task of hashing calculations for mining blocks very fast and make blockchain technology smarter. Nodes in blockchain technology are connected in chronological order with each other by putting the hashing code of the next node in a network. Because of the proof of work and smart contract applications, the node verifies the mining node. Block nodes may contain a variety of information like timestamp, nonce, block number, hash code of previous and next node in blockchain, etc. Four main types of blockchain platforms exist private,

public, consortium, and hybrid on which other blockchain technology work like bitcoin, Ethereum, Hyperledger, etc. Transactions cannot be edited means they can be added but cannot be altered. A nonce is a number only used once to generate the hash value of a new block for authentication where that hash value is less than the targeted hash value. The targeted hash value is set after the generation of every 2016 block. To find out the nonce value which is a 32-bit number more machine computations are used. For fast computation machine learning can be used to improve the performance of this technology.

B. Machine Learning

The purpose of machine computing techniques is to make machines that can think itself on their experiences from training data. It's at the crossroads of probabilistic statistics and computer engineering science and probability statistics, or the crux of data analytic science and artificial intelligence and it's one of the most rapidly growing technical fields nowadays. Significant upgrades in cognitive computing have been fuelled by the creation of innovative theory and learning methods, including the continued growth in the accessibility of digitalized data and minimal computing. In a range of disciplines, such as financial forecasting, business, wellness, administration; industrial, and education, content-oriented machine-learning methodologies are rapidly being utilized in exploration, technologies, and commercialization, yielding much more concrete proof outcomes [1].

