Towards artificial neural network and blockchain conjunction: life-long deep learning system

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Abstract

Blockchain and deep learning are two promising technologies flourishing in recent years. They come from different domains and barely have practical connections to each other. Existing machine learning frameworks fail to provide trusted widely accepted models which can be trained collaboratively and often require costly retraining for new classes. On the other hand, blockchain technology at current state is computationally slow and has significant economic burden which makes it difficult to use with machine learning.

In this paper, we mediate between these two different technology domains, explore feasibility and new opportunities of implementation of artificial neural networks in blockchain state transition system to solve two big problems: trust and long-term memory in the machine learning frameworks. We propose a novel blockchain based incremental learning framework inspired by the neuroscience research findings in the brain dual-memory system which builds trust among participants and create life learning models.

1 Introduction

Nowadays, capabilities of blockchain technology achieved different level of performance and security as it was with the first projects appeared along with cryptocurrency protocols. State transition virtual machines (smart contracts) implemented