Towards artificial neural network and blockchain conjunction: incremental trusted 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. Moreover, its hard to find mutually beneficial combination of these technologies because of their different goals.

On the one hand, 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 and propose a novel approach to build trust and incrementally preserve long-term memory of a deep learning model. Our approach is inspired by neuroscience research findings in the brain dual-memory system and collaborative trust provided by blockchain technology.

1 Introduction

Nowadays blockchain technology is changing the landscape of many industries by providing new possibilities of automation, security, and trust. Success of the first cryptocurrency Bitcoin proved that a long term cryptographical dream can materialize and