DeepLink

DeepLink is a nodeless, deep learning consensus mechanism and blockchain platform that utilizes Cassandra for data storage and enables fast, autonomous validation of

transactions for a variety of use cases across industries.

Written by: *Aren Can Coemert Bagci*

Abstract:

The consensus mechanism we created is based on deep learning, a type of artificial intelligence that involves training a model on large amounts of data in order to make predictions or decisions. In the case of our blockchain, the deep learning model is used to validate transactions by analyzing data from previous transactions stored in a Cassandra database. By continuously learning from past data, the model is able to make more accurate and efficient decisions about whether to approve or reject a given transaction.

The blockchain itself is a distributed ledger that allows for the secure and transparent recording of transactions. In our design, the deep learning consensus mechanism serves as the primary means of verifying transactions and adding them to the blockchain. In addition to serving as a record of transactions, the blockchain can also support the execution of smart contracts, which are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code.

The system we designed is nodeless, meaning it does not rely on traditional nodes (computing devices connected to the network) to validate and record transactions. Instead, the deep learning model is integrated directly into the blockchain, allowing it to operate autonomously and continuously improve its accuracy over time. This nodeless design makes the system more scalable and efficient, as it does not rely on a fixed number of nodes to process transactions.

Introduction:

Our system is a decentralized, nodeless blockchain that uses a deep learning consensus mechanism to validate transactions. It utilizes Cassandra for data storage and is capable of handling high volumes of transactions per second.

Deep Learning Consensus Mechanism:

The deep learning consensus mechanism is trained on historical transaction data to accurately predict the likelihood of a transaction being valid. It does this by analyzing various features of the transaction, such as the sender and recipient ID and the amount being transferred. The model is able to continually learn and improve its prediction accuracy over time as it is exposed to more data.

In order to implement the deep learning consensus mechanism, we first need to train the model on a large dataset of past transactions. This can be done using a variety of machine learning techniques, such as gradient descent and backpropagation. Once the model is trained, it can be integrated into the blockchain

as a validator. Transactions can then be passed through the model, and those that are predicted to be valid will be added to the blockchain.

Cassandra Data Storage:

Cassandra is a distributed database that is designed to handle large amounts of data across multiple servers. It is particularly well-suited for use in a blockchain because it can scale horizontally, allowing the blockchain to handle an increasing number of transactions without experiencing performance degradation.

In our system, Cassandra is used to store transaction data as well as the data used to train the deep learning model. This data is distributed across multiple servers, ensuring that it is always available and that the system can continue to operate even if a server goes offline.

Nodeless Architecture:

One of the key features of our system is that it is nodeless, meaning that it does not rely on a specific set of servers or computers to function. This makes it more resilient to attacks and ensures that it is able to operate even if individual nodes go offline.

To implement a nodeless architecture, we utilize a distributed network of servers that are responsible for storing and processing data. These servers can be added or removed from the network as needed, allowing the system to scale horizontally and handle an increasing number of transactions.

Integration and Implementation:

To integrate our system into an existing application or platform, it is necessary to connect to the Cassandra database and retrieve the relevant data. This can be done using the Cassandra API, which provides a set of functions for interacting with the database.

Once the data has been retrieved, it can be passed through the deep learning model to determine whether the transaction is valid. If the model predicts that the transaction is valid, it can be added to the blockchain using the appropriate API calls.

Conclusion:

In summary, our system is a decentralized, nodeless blockchain that uses a deep learning consensus mechanism and Cassandra for data storage. It is capable of handling high volumes of transactions per second and is able to continually learn and improve its prediction accuracy over time. By integrating this system into an existing application or platform, it is possible to leverage the benefits of blockchain technology while also reducing the risk of attacks and downtime.

Appendix:

Repository	Function
AI Consensus Mechanism	Consensus mechanism using a deep learning model to validate transactions
Cassandra DB	Database to store transactions for training the AI and to store data for other applications
CBDC	Central bank digital currency implemented on top of the AI blockchain
Deep Learning Blockchain	Blockchain implementation using the AI consensus mechanism
Smart Contracts	Allows users to create and execute smart contracts on the AI blockchain