LICENSING OPPORTUNITY:
DIAGONAL NODE DATA BLOCK MATRIX FOR ADDING HASH-LINKED RECORDS AND DELETING ARBITRARY RECORDS WHILE PRESERVING HASH-BASED INTEGRITY ASSURANCE

DESCRIPTION

Problem

Existing blockchains and Distributed Ledger Technology (DLT) do not allow for changes or deletions of information, which can prevent their use in privacy-sensitive applications, or systems that must adhere to privacy regulations such as General Data Protection Regulation (GDPR). Additional risks include accidental or malicious data insertion and storage bloat, which can be costly for data storage and increase liability.

Invention

The invention is a data structure, referred to as a block matrix, that uses an array of blocks with hash values for each row and column. The invention supports the ongoing addition of hash-linked records while also allowing the deletion of arbitrary records, preserving hash-based integrity assurance that other blocks are unchanged.

BENEFITS

Commercial Application

- The invention can be used in deep learning models for fast matrix calculations.
- It can be applied in financial services and high frequency trading (HFT) because it enables real-time risk assessment, fraud detection, and algorithmic trading.
- It can be used for big data and cloud computing and improve data compression, making cloud storage more efficient.

Competitive Advantage

The block matrix structure advantages over traditional linear systems are faster data processing, flexibility and adaptability allowing modification and adjustments, and can be used for secure encryption and error correction.

	0	1	2	3	4	
0						$H_{0,-}$
1						$H_{1,-}$
2						$H_{2,-}$
3			X			$H_{3,-}$
4						$H_{4,-}$
	$H_{-,0}$	$H_{-,1}$	$H_{-,2}$	$H_{-,3}$	$H_{-,4}$	

Fig. 1. Block matrix

	0	1	2	3	4	
0	•	1	3	7	13	$H_{0,-}$
1	2	•	5	9	15	$H_{1,-}$
2	4	6	•	11	17	$H_{2,-}$
3	8	10	12	•	19	$H_{3,-}$
4	14	16	18	20	•	$H_{4,-}$
	$H_{-,0}$	$H_{-,1}$	$H_{-,2}$	$H_{-,3}$	$H_{-,4}$	

Fig. 2. Block matrix with numbered cells

1	2	5	10
3	4	7	12
6	8	9	14
11	13	15	16

Fig. 3 Block matrix with diagonal used

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