ZhenXing Hu

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EDUCATIONA

2018-09 – 2024-01	**Peking University**	Computer Architecture	**Ph.D.**
2015-09 – 2018-06	**University of Chinese Academy of Science**	Computer Application	**M.S.**
2010-09 – 2014-06	**WuHan University**	Software Engineering	**B.S.**

RESEARCH DIRECTION

- Blockchain network and consensus optimization; New blockchain data distribution frameworks.
- Familiar with BTC, ETH, Fabric; Familiar with consensus protocols such as Paxos, Raft, PBFT, HotStuff.

RESEARCH PROJECTS

- **Ant Group:Research on Networking of Large Scale Permissioned Chains** 2022.03–2023.02
  - **Motivation and Methods:** To address the challenge of enhancing the throughput of large-scale alliance chain networks, solely focusing on improving TPS from the consensus layer or network layer is insufficient. Therefore, this study introduces a novel data distribution strategy called *Predis*, along with the corresponding network topology known as *Multi Zone*.
  - **Research Results:** We implemented Predis and Multi-Zone on open-source implementations of HotStuff and PBFT. The experiments have demonstrated a significant improvement in the throughput of PBFT and HotStuff, with an increase of **300%**. Additionally, the block propagation latency is reduced to half compared to the existing network topologies. It is worth noting that this project has resulted in the creation of **8** patents.
- **Project: Optimization of block distribution performance in blockchain networks** 2020.03–2021.12
  - **Motivation and Methods:** In relation to the matter of blockchain network layer block distribution, this study presents a novel block transmission scheme called *Dino*. *Dino* departs from the approach of compressing content and instead adopts a method of transmitting block construction rules. This design choice ensures that the bandwidth consumption of the transmitted block remains unaffected by the transaction volume.
  - **Research Results:** We deployed *Dino* in the main network environments of BTC and BCH for testing, and the experiments have demonstrated that Dino can compress 1 MB blocks to approximately 500 Bytes, achieving a compression ratio of **2000** times. It effectively reduces the bandwidth consumption of transmitted blocks to a *constant level*, setting a new state-of-the-art (SOTA) standard in block compression schemes currently available.
- **Yeez Tech: Blockchain based data cooperation solution** 2020.10–2021.03
  - **Motivation and Methods:** Under the constraint of data not leaving the domain, this research proposes a solution to accomplish Trusted Computing of data provider's data by utilizing the analysis program of the data consumer.
  - **Research Results:** I implemented a basic neural network in C++ and integrated KNN for SGX to invoke it. Additionally, I implemented the KNN algorithm using Solidity within the Truffle and Ganache frameworks.

PUBLICATIONS AND PATTERNS (THE FIRST AUTHOR)

- Dino: A Block Transmission Protocol with Low Bandwidth Consumption and Propagation Latency. **INFOCOM 2022**
- A New Data Flow Framework with High Throughput and Low Latency for Permissioned Blockchains. **ICDCS 2023**
- Toward Block Synchronization via Transmitting Block Construction Rules. **TC under review.**
- A Consensus Method in Blockchain Systems. *(202211216361.0).*
- A pre transmission method for transaction data, blockchain system, and consensus nodes. *(202211737964.5)*
- A networking method for blockchain networks, blockchain networks, and node devices. *(202211742874.5)*
- A networking method for blockchain networks, blockchain networks, and node devices. *(202211739524.3)*
- A consensus data distribution method and blockchain network in blockchain networks *(202211737971.5*
- A consensus data distribution method and blockchain network in blockchain networks *(202211735064.7)*

REWARDS

- PKU "**Outstanding Scientific Research Award**" 2020-2021
- UCAS "**National Scholarship**" 2017-2018