

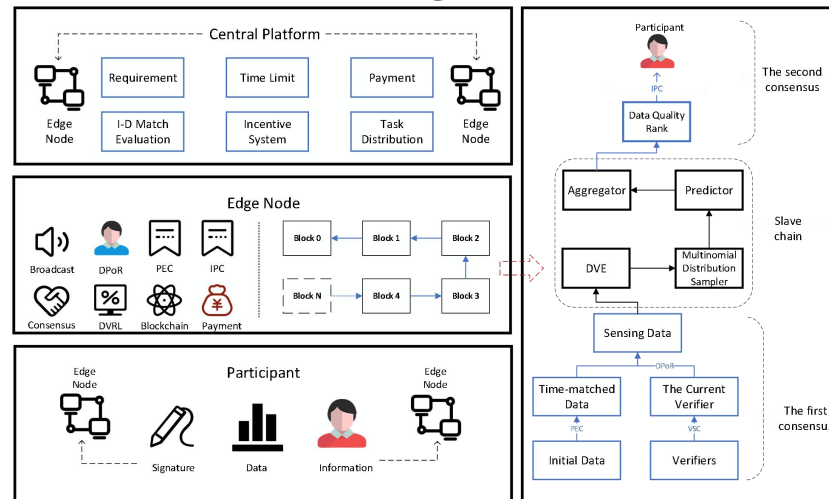
# A Blockchain-based Framework for Data Quality in Edge-Computing- Enabled Crowdsensing

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# Problems & Ideas

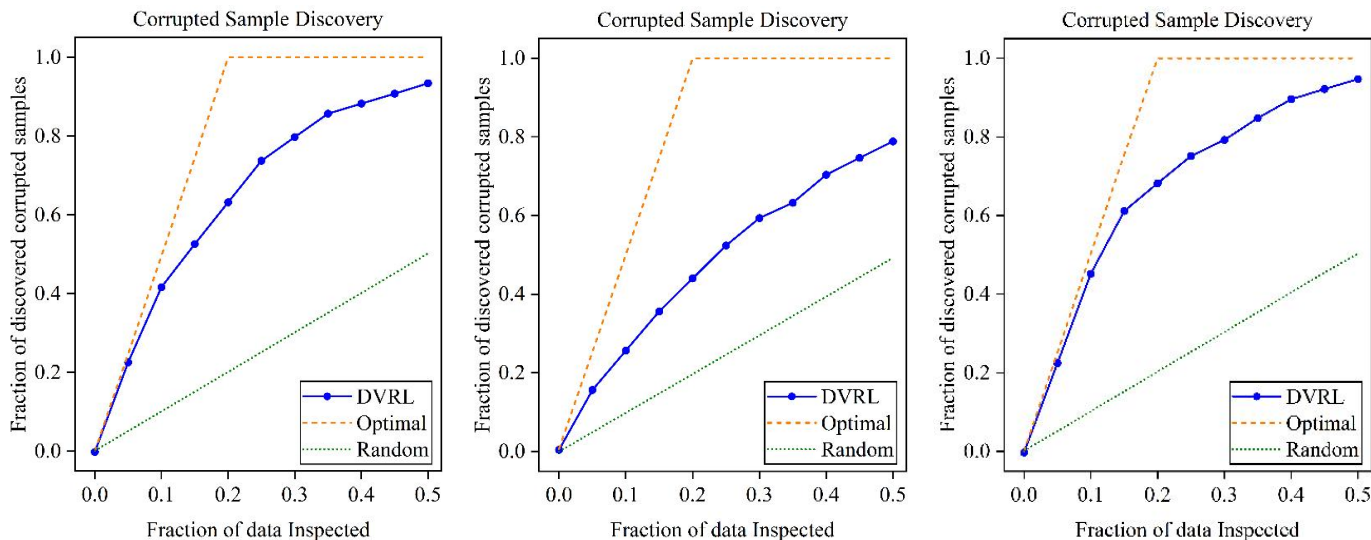
- Problems of traditional crowdsensing :
  - The computational burden on the central platform requires devices with sufficient calculation power to collect and process data.
  - The privacy of participant information needs to be protected during the entire process of crowdsensing task.
  - The traditional quality assessment methods have the problems of cooperative cheating and negative work of participants.
- Ideas: A blockchain-based framework for data quality in edge-computing-enabled crowdsensing.



Edge computing is introduced to reduce the computational burden on the central platform. The edge computing devices (ECDs) are limited by their own capability so ECDs are required to cooperate. We added blockchain into our framework. Each ECDs can only obtain part of the information so privacy of participants can be protected. Reinforcement learning (RL) is introduced for quality assessment because of its strong ability to formulate an optimal strategy in the absence of historical data.

# Main Contributions

- Contributions:
  - An edge-computing-enabled crowdsensing framework based on the blockchain is proposed. ECDs are organized by the blockchain;
  - A lightweight consensus mechanism is proposed instead of Proof of Work(PoW). To restrain the behaviors of parties involved in the blockchain, smart contracts are redesigned;
  - A data quality assessment mechanism based on reinforcement learning is proposed;



Corrupted sample discovery on Adult, Blog and Wine Quality data sets. The rate of discovering corrupted samples increased the fastest when the data inspected is under 20%.