Incentive mechanism design via smart contract in blockchain-based edge-assisted crowdsensing

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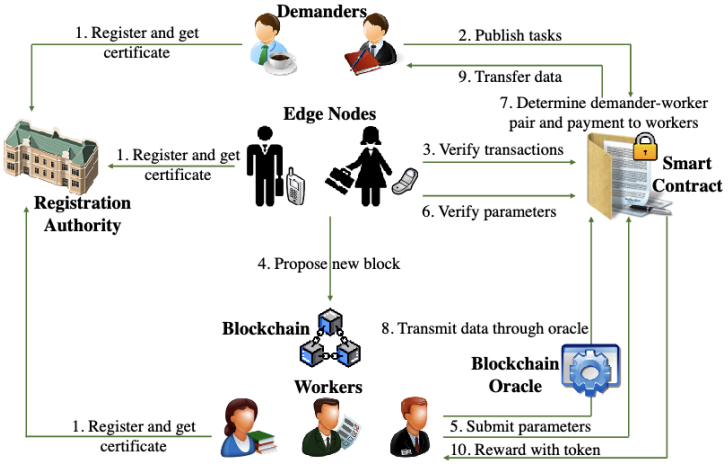
Problems & Ideas

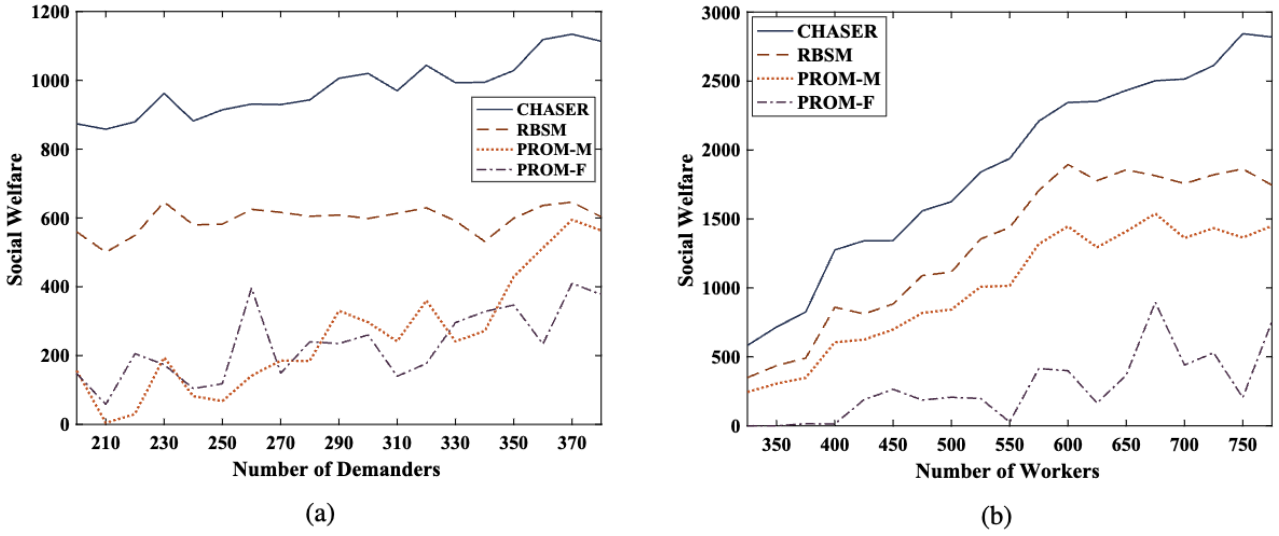
- Problems of conventional Incentive mechanism in Edge-assisted mobile crowdsensing:
  - Traditional EMCS architecture relies on a centralized platform, which inherently suffers from a single point of failure.
  - EMCS systems store sensitive information about demanders and workers, posing risks of privacy breaches and data loss.
- Ideas: Combine the traditional EMCS system with blockchain and design an blockchain based incentive mechanism via the smart contract.



Unlike the traditional EMCS systems, blockchain-based EMCS systems utilize the advantages of blockchain to overcome the single point failure and the risk of privacy leakage.

Main Contributions

- Contributions:
  - a novel incentive mechanism is proposed, namely, CHASER, applying smart contracts after building on a BEMCS;
  - It is proved that CHASER ensures a high competitive ratio on social welfare, which means that all participants can gain benefits when taking part in the sensing tasks;
  - The integration of CHASER in smart ensures data confidentiality. Additionally, it provides anonymity for data demanders and workers by utilizing an anonymous authentication approach based on zk-SNARK.



(a). Social welfare versus different numbers of demanders, where the number of workers is 400. (b). Social welfare versus different numbers of workers, where the number of demanders is 800.