DR. YUNPENG ZHANG

Assistant Professor

Information and Logistics Technology

University of Houston

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Decentralized, Block Chain Based Access Control Framework for the Heterogeneous Internet of Things

Abstract: Privacy and safety are the most needed features while accessing the data in the IoT. Due to the complicated decentralization and heterogeneous environment present in IoT, the security and privacy of the data becomes a challenging job for the developers. The current methods are not suitable for these scenarios where a decentralized and heterogeneous system exists. This paper provides a new method for access control in IoT based on the booming technology Block Chain, which helps the user in accessing or controlling their data. The contribution consists of a description of the model used to show how a blockchain is used for creating access control methods. To implement the method, the blockchain is taken as the decentralized access manager. The proposed method is validated with respect to the previous related work. Finally, the limitations and future work of the paper are discussed. Access Control Systems are proved to provide access control to critical resources. The right to access the resources is defined by the access control policies that are executed during the access request time.

Biography: Dr. Yunpeng (Jack) Zhang's research focuses on developing novel security techniques to ensure cyber/physical system reliability, security and performance in multiple industries, including energy, healthcare, smart cities, commerce, transportation, etc. His work has not only resulted in more than 60 publications for prestigious conferences and journals in the cybersecurity field, but has also led to practical solutions to real-world problems. Dr. Zhang has invented more than 30 high-performance/security new algorithms/methods and developed ten software systems. Dr. Zhang's current research focuses on (1) Researching distributed Ledger (Blockchain) technologies to enhance supply chain, energy industry cyber and physical security, etc.;(2) Designing approaches for the inter-organizational workflows data safe sharing and policies of security access data in multiple workflow systems to reduce cyber-attack and data loss risks; (3) Researching decentralized, reliable and self-organized multi-layer security frameworks to identify spoof nodes, prevent malicious node attacks and ensure the validity and credibility of the data in the heterogeneous Internet of Things; and (4) a key challenge faced by major access control industries, XACML policies analysis, and he is developing effective and efficient approaches to detecting and correcting the policies.