

Method And System For Generating And Managing A Decentralized Identity For Robots

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ABSTRACT

A method (600) and a system (100) for generating and managing a decentralized identity for a robot (112) is disclosed. A robot identity management device (102) receives a set of unique identifiers associated with the robot (112). Each unique identifier is serialized and hashed to generate a plurality of hashed identifier values. The plurality of hashed identifier values is sharded into multiple shards using a cryptographic secret-sharing scheme. A decentralized identity is generated by reconstructing at least a subset of the shards and applying a cryptographic function. The decentralized identity is stored in a blockchain ledger to provide immutable identity verification for the robot (112).

KEY APPLICATION AREAS

1. Robot identity and authentication.
2. Blockchain-based security for autonomous systems.
3. Industrial IoT and connected robotics.
4. Access control and trust management in robotic ecosystems.
5. Decentralized digital identity (DID) systems for robots.

POTENTIAL USE

1. Authenticating robots in factories, warehouses, and smart infrastructure.
2. Preventing robot identity spoofing, tampering, and unauthorized reprogramming.
3. Secure robot-to-robot and robot-to-cloud communication.
4. Managing access to restricted zones, tasks, and resources.
5. Reputation-based trust scoring and authorization of autonomous robots.
6. Auditable tracking of robot capabilities, performance, and operational history.