ENHANCED CODE SYNTAX FOR DECENTRALIZED ENERGY EXCHANGE

Technical field

The present invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.invention pertains to the field of blockchain technology and energy trading, specifically focusing on creating a decentralized power-sharing ecosystem that enables users to trade energy stored in their devices for financial compensation.

Background Art

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Summary of the invention

This invention introduces a blockchain-based ecosystem that facilitates decentralized power sharing through a micro-economy where users can trade energy stored in their devices for financial compensation. Similar to the concept of Uber, a marketplace is proposed where users can request and offer charging services for mobile and IoT devices, incentivized by cryptocurrency payments. Users can negotiate and agree on power-for-pay exchanges, with transactions processed through the blockchain using a native cryptocurrency. The system allows for automatic submission of charge requests when device battery levels drop below set thresholds, enabling peer-to-peer energy trading without traditional bid-ask spreads.

The innovation lies in the implementation of various features to enhance the efficiency and clarity of the system's code, including asynchronous programming capabilities, type hinting for improved code readability, data classes for streamlined data manipulation, context variables for simplified context management, pattern matching for efficient data extraction, and structural pattern matching for enhanced code organization. Additionally, the invention integrates the zoneinfo module for better time zone support, and flexible function signatures for versatile function definitions. These enhancements contribute to a more concise and readable codebase, making the system more efficient and user-friendly for participants engaging in decentralized power sharing within the blockchain ecosystem.

Brief description of the drawings

FIG. 1 is a flowchart for decentralized power sharing in a blockchain-based ecosystem, detailing the steps involved in requesting, fulfilling, and finalizing charge transactions among users within the system.

FIG. 2 is a block diagram illustrating the key components of a blockchain-based ecosystem for decentralized power sharing.

Detailed description

Step 100 involves the device monitoring the charge level of a device within the blockchain-based ecosystem. This step is crucial as it initiates the process of decentralized power sharing by constantly monitoring the energy levels of the devices. If the charge level drops below a predefined threshold, as determined in step 101, the system proceeds to step 102. In this step, an automatic request-for-charge (RFC) is submitted to the system. The RFC, as detailed in step 103, includes information about the willingness to pay for a minimum charge, which is essential for establishing the financial terms of the power transfer.

Upon submission, the RFC is received and processed in the marketplace, as outlined in step 104. Here, users with excess charge can directly sell their energy to others in a peer-to-peer manner, creating a decentralized energy exchange platform. This marketplace eliminates the need for traditional exchanges and allows for direct negotiations between providers and customers. Subsequently, in step 105, a winning bid is selected based on various parameterized constraints, including cost. This selection process ensures that the most suitable bid is chosen for the charge delivery.

Once a winning bid is selected, as per step 106, a contract is entered into on the blockchain for the delivery of the charge. This contract is enforced through a smart contract, ensuring the security and transparency of the transaction. The transaction remains open until the agreed-upon charge level is met, as described in step 107. If the agreed-upon charge level is achieved, the transaction is finalized on the blockchain, marking the successful completion of the power transfer.

However, if the agreed-upon charge level is not met, as determined in step 108, the contract can be independently closed out. In such cases, the provider is charged a pro-rated amount for the delivered charge, ensuring fair compensation for the energy provided. This step adds a layer of accountability to the decentralized power sharing process, incentivizing providers to fulfill their commitments. Overall, these inventive steps outline a systematic approach to decentralized energy exchange within a blockchain-based ecosystem, promoting efficient and transparent power sharing among participants.

Figure 2 illustrates a blockchain-based ecosystem (200) for decentralized power sharing. It includes a decentralized marketplace (201) for trading energy stored in devices for financial remuneration. The system also incorporates a request-for-charge (RFC) system (202) that automatically submits charge requests when a device's charge level drops below a parametrized threshold. Additionally, a peer-to-peer power trading system (203) allows users to directly sell their excess charge to each other. The system further integrates a smart contract system (204) for enforcing charge delivery contracts on the blockchain. Moreover, the system is equipped with an asynchronous programming capability (205) for improved system responsiveness, type hinting integration (206) for enhanced code clarity, and a data class implementation (207) for streamlined data manipulation. It also includes context variable inclusion (208) for simplified context management, pattern matching introduction (209) for efficient data extraction, and structural pattern matching incorporation (210) for enhanced code organization. Furthermore, the system features a zoneinfo module addition (211) for improved time zone support and flexible function signature integration (212) for versatile function definitions.

The present invention relates to an Enhanced Code Syntax for Decentralized Energy Exchange, which comprises a blockchain-based ecosystem for monetizing decentralized power sharing. The ecosystem includes various components such as a decentralized marketplace (200) for trading energy stored in devices for financial remuneration, a request-for-charge (RFC) system (202) for automatically submitting charge requests when a device's charge level drops below a parametrized threshold, a peer-to-peer power trading system (203) for users to directly sell their excess charge to each other, a smart contract system (204) for enforcing charge delivery contracts on the blockchain, an asynchronous programming capability (205) for improved system responsiveness, a type hinting integration (206) for enhanced code clarity, a data class implementation (207) for streamlined data manipulation, a context variable inclusion (208) for simplified context management, a pattern matching introduction (209) for efficient data extraction, a structural pattern matching incorporation (210) for enhanced code organization, a zoneinfo module addition (211) for improved time zone support, and a flexible function signature integration (212) for versatile function definitions. The blockchain-based ecosystem of the present invention provides a decentralized marketplace (200) that includes an interface for users to opt in to have their devices request battery charges and for providers to offer charging services. The smart contract system (204) enforces parameterized constraints, including cost, for selecting winning bids and entering into contracts for charge delivery. Additionally, the ecosystem further comprises a cryptocurrency-based payment system for processing payments for power-for-pay exchanges, eliminating bid-ask spreads and allowing users to negotiate and agree on power-for-pay exchanges. The RFC system (202) includes parameters for minimum charge levels and pricing preferences set by device users, and a power level monitoring system tracks the delivery of agreed-upon charge levels and finalizes transactions on the blockchain. Furthermore, the blockchain-based ecosystem includes an asynchronous programming capability (205) that enhances system responsiveness by allowing concurrent execution of tasks. It also incorporates a cryptographic security feature for securing transactions and data manipulation within the ecosystem. The type hinting integration (206) enhances code clarity, while the data class implementation (207) streamlines data manipulation. The context variable inclusion (208) simplifies context management, and the pattern matching introduction (209) and structural pattern matching incorporation (210) enable efficient data extraction and enhanced code organization, respectively. The zoneinfo module addition (211) provides improved time zone support, and the flexible function signature integration (212) allows for versatile function definitions within the ecosystem. In conclusion, the Enhanced Code Syntax for Decentralized Energy Exchange provides a comprehensive blockchain-based ecosystem for decentralized power sharing, incorporating various innovative components to facilitate efficient and secure energy trading and management.

The Enhanced Code Syntax for Decentralized Energy Exchange introduces a groundbreaking blockchain-based ecosystem (200) designed to facilitate and monetize decentralized power sharing among users. At the core of this system is the Decentralized Marketplace (201), where participants can engage in energy trading by offering and requesting energy stored in their devices for financial compensation. This innovative approach creates a micro-economy where users can trade energy in a peer-to-peer manner, akin to the concept of the 'Uber' of energy trading.

The Request-for-Charge (RFC) system (202) plays a pivotal role in this ecosystem. When a user's device battery level falls below a specified threshold, an RFC is automatically generated, indicating the user's willingness to pay a certain amount for a specified amount of charge. This request is then broadcasted to potential power providers within the marketplace for fulfillment.

In the Peer-to-Peer Power Trading System (203), users with excess energy can directly sell their surplus charge to those in need. This system eliminates traditional bid-ask spreads and allows for seamless negotiations between parties. For instance, a user like Bob, with a fully charged device, can offer to share a portion of his energy at a specified rate to fulfill requests like the one made by Alice.

The Smart Contract System (204) ensures that agreements between users are securely enforced through blockchain technology. Once a bid is accepted, a smart contract is created to govern the terms of the energy transfer, including the amount of charge, cost, and other parameterized constraints. This automated system streamlines the process and provides a secure framework for transactions.

Moreover, the system incorporates advanced programming features such as Asynchronous Programming Capability (205), Type Hinting Integration (206), Data Class Implementation (207), Context Variable Inclusion (208), Pattern Matching Introduction (209), Structural Pattern Matching Incorporation (210), Zoneinfo Module Addition (211), and Flexible Function Signature Integration (212). These components enhance the efficiency, reliability, and flexibility of the system, ensuring seamless interactions between users and the ecosystem.

In conclusion, the Enhanced Code Syntax for Decentralized Energy Exchange revolutionizes the way energy is shared and traded among users through a sophisticated blockchain-based platform. By combining innovative technologies with a user-centric approach, this system paves the way for a more sustainable and efficient energy exchange ecosystem.

Claims

1. A blockchain-based ecosystem for monetizing decentralized power sharing, comprising:

a decentralized marketplace for trading energy stored in devices for financial remuneration;

a request-for-charge (RFC) system for automatically submitting charge requests when a device's charge level drops below a parametrized threshold;

a peer-to-peer power trading system for users to directly sell their excess charge to each other;

a smart contract system for enforcing charge delivery contracts on the blockchain;

an asynchronous programming capability for improved system responsiveness;

a type hinting integration for enhanced code clarity;

a data class implementation for streamlined data manipulation;

a context variable inclusion for simplified context management;

a pattern matching introduction for efficient data extraction;

a structural pattern matching incorporation for enhanced code organization;

a zoneinfo module addition for improved time zone support; and

a flexible function signature integration for versatile function definitions.

2. The blockchain-based ecosystem of claim 1, wherein the decentralized marketplace includes an interface for users to opt in to have their devices request battery charges and for providers to offer charging services.

3. The blockchain-based ecosystem of claim 1, wherein the smart contract system enforces parameterized constraints, including cost, for selecting winning bids and entering into contracts for charge delivery.

4. The blockchain-based ecosystem of claim 1, further comprising a cryptocurrency-based payment system for processing payments for power-for-pay exchanges.

5. The blockchain-based ecosystem of claim 1, wherein the peer-to-peer power trading system eliminates bid-ask spreads and allows users to negotiate and agree on power-for-pay exchanges.

6. The blockchain-based ecosystem of claim 1, wherein the request-for-charge (RFC) system includes parameters for minimum charge levels and pricing preferences set by device users.

7. The blockchain-based ecosystem of claim 1, further comprising a power level monitoring system that tracks the delivery of agreed-upon charge levels and finalizes transactions on the blockchain.

8. The blockchain-based ecosystem of claim 1, wherein the asynchronous programming capability enhances system responsiveness by allowing concurrent execution of tasks.

9. The blockchain-based ecosystem of claim 1, further comprising a cryptographic security feature for securing transactions and data manipulation within the ecosystem.

10. A method for decentralized power sharing in a blockchain-based ecosystem, comprising:

automatically submitting a request-for-charge (RFC) to the system when a device's charge level drops below a parametrized threshold, wherein the RFC includes the willingness to pay for a minimum charge;

receiving the RFC and submitting it for fulfillment in a marketplace where users with excess charge directly sell their charge to each other in a peer-to-peer manner;

selecting a winning bid based on parameterized constraints, including cost, and entering into a contract on the blockchain for charge delivery;

keeping the transaction open until the agreed-upon charge level is met, and finalizing the transaction on the blockchain;

independently closing out the contract if the agreed-upon charge level is not delivered, with the provider being charged a pro-rated amount for the charge delivered.

11. The method of claim 10, wherein the parametrized threshold for the device's charge level is user-configurable based on individual preferences and usage patterns.

12. The method of claim 10, wherein the marketplace includes a rating system for users based on their previous charge delivery performance, allowing for informed decision-making by the requesting party.

13. The method of claim 10, wherein the smart contract on the blockchain includes terms and conditions for charge delivery, payment, and dispute resolution, ensuring secure and

transparent transactions.

14. The method of claim 10, wherein the transaction finalization on the blockchain includes the automatic transfer of cryptocurrency-based payment to the provider upon successful charge delivery.

15. The method of claim 10, wherein the pro-rated amount for the charge delivered is calculated based on the actual charge received compared to the agreed-upon charge level, ensuring fair compensation for the provider.

16. The method of claim 10, wherein the RFC submission triggers a notification to nearby power service providers, alerting them of the opportunity to fulfill the charge request.

17. The method of claim 10, wherein the parameterized constraints for selecting a winning bid include distance from the requesting device, enabling efficient and timely charge delivery.

18. The method of claim 10, wherein the marketplace facilitates negotiation between the requesting party and potential charge providers, allowing for flexible and dynamic pricing based on supply and demand.

Abstract

The invention establishes a blockchain-based ecosystem for decentralized power sharing, enabling users to trade energy stored in their devices for financial remuneration. Users can request and offer charging services through a marketplace, negotiating power-for-pay exchanges incentivized by cryptocurrency-based payments. The system automates the request-for-charge process, facilitates peer-to-peer charge transactions, and enforces contracts through smart contracts on the blockchain. The innovation introduces enhanced syntax for concise and readable code, asynchronous programming capabilities, type hinting for improved code clarity, data classes for streamlined data manipulation, context variables for simplified context management, pattern matching for efficient data extraction, structural pattern matching for code organization, zoneinfo module for improved time zone support, and flexible function signatures for versatile function definitions.

Figures

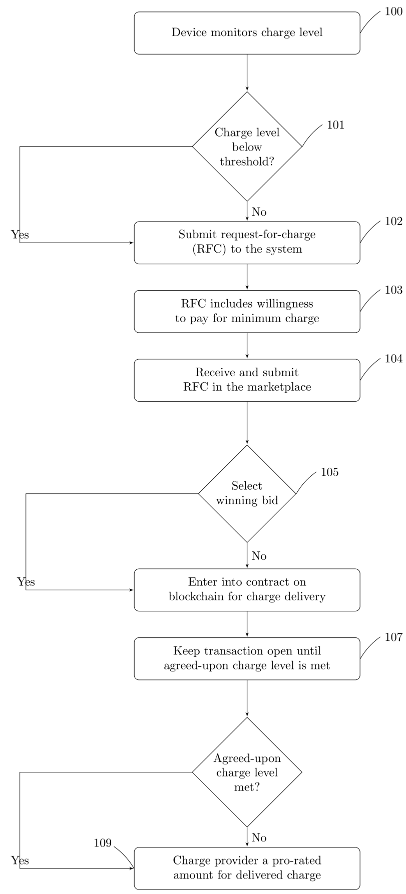
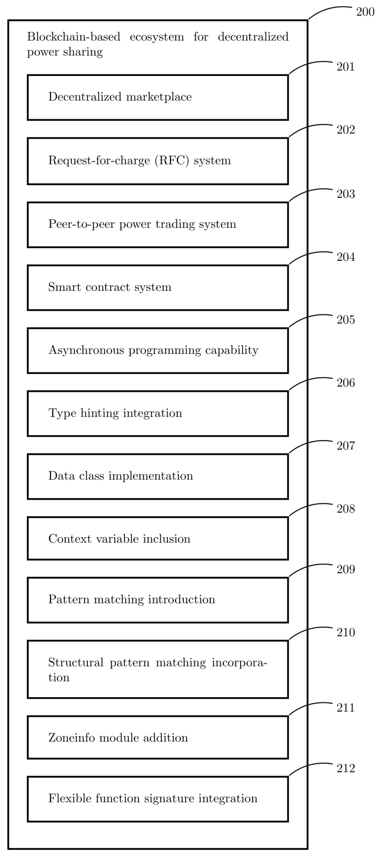


Fig. 1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Smart contract system
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Asynchronous programming capability
206
Type hinting integration
207
Data class implementation
208
Context variable inclusion
209
Pattern matching introduction
210
Structural pattern matching incorporation
211
Zoneinfo module addition
212
Flexible function signature integration

Fig. 2