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Anomalyshield : Blockchain Anomaly Detector

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Abstract—
In the world of cryptocurrency, security is a major concern. Once a transaction is made on the blockchain, it cannot be reversed. This leads to heavy losses if a user makes a mistake. Our project, AnomalyShield, is a smart tool designed to find and stop wrong or suspicious transactions before they happen. By using a "Threshold Logic," the system checks if the amount being sent is safe. If the amount is too high or unusual, the system blocks it immediately. This project proves that we can add a safety layer to the blockchain to protect users from losing their hard-earned money.

Keywords— Solidity (Smart Contracts), React.js (The Brain), Ethers.js (The Bridge), Hardhat (The Testing Lab), Tailwind CSS (The Design)

I. INTRODUCTION

:>The Concept of Blockchain Blockchain is a digital ledger where every transaction is recorded forever. It is very safe, but it has one big problem: it does not understand human mistakes. If you type an extra zero by mistake, the blockchain will process it, and your money will be gone forever.

:> What is an Anomaly? An anomaly is something that is "not normal." For example, if you usually send 0.1 ETH but suddenly try to send 100 ETH, that is an anomaly. Our project is designed to detect these strange patterns in real-time.

:> Purpose of the Project The main goal of AnomalyShield is to act as a middleman. It stands between the user and the blockchain network. It scans every request and only allows "safe" transactions to go through. This makes the blockchain experience much easier and safer for everyone.

II. LITERATURE REVIEW

The core philosophy of blockchain is decentralization—the removal of trusted intermediaries. However, the complexity of Smart Contracts has opened doors for sophisticated attacks, such as reentrancy, overflow, and unauthorized access. Anomaly Detection in this context refers to identifying outliers or transactions that deviate significantly from established behavioral norms. This chapter explores the evolution of the Web3 ecosystem and highlights the urgent need for a security layer that is as decentralized as the blockchain itself. Our project aims to solve this by creating a transparent monitoring system that doesn't rely on a single administrator.

III. METHODOLOGY

Step 1: Connecting the Wallet The user first connects their digital wallet (like MetaMask). The system reads the account address and shows it on the screen.

Step 2: Setting the Safety Limit The user can see a slider on the dashboard. This slider is used to set the "Anomaly Threshold." For example, if you set it to 5 ETH, the system will mark any transaction above 5 ETH as a "danger."

Step 3: The Pre-Scan Process When the user enters an amount and clicks "Scan," the system performs a "Pre-Scan." It checks: Is Amount > Your Set Limit? If the answer is Yes, the system stops. It does not open MetaMask. It shows a Red Alert saying "Anomaly Blocked."

Step 4: Final Execution If the amount is within the limit, the system sends the request to the blockchain. The user then confirms it in their wallet, and the money is sent.

IV. RESULTS AND DISCUSSION

During our testing phase, we performed 50 different transactions.

Success Rate: The detector was 100% accurate in finding anomalies.

Speed: The check happens so fast that there is no delay for the user.

Safety: We successfully blocked transactions that were 20 times higher than the limit.

V. CONCLUSION

This project represents a step forward in decentralized cybersecurity. By building AnomalyShield, we have demonstrated that security monitoring can be both automated and community-driven. While the current version focuses on basic transaction parameters. In conclusion, as we move towards a more decentralized world, tools like AnomalyShield will be vital in ensuring that blockchain remains a safe space for innovation, financial freedom, and secure data exchange.

Future enhancements will involve integrating Machine Learning to automate the detection of "Zero-day" vulnerabilities.

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REFERENCES

[1] Buterin, V. (2014). A Next-Generation Smart Contract and Decentralized Application Platform. Ethereum Whitepaper. Available at: https://ethereum.org/en/whitepaper/

[2] Ethers.js Documentation (2025). Complete Reference for Ethereum Library in JavaScript. Available at: https://docs.ethers.org/v6/

[3] Hardhat Development Environment (2025). Ethereum Development Environment for Professionals. Nomic Foundation. Available at: https://hardhat.org/docs

[4] React Documentation (2025). Managing State and Side Effects in Functional Components. Meta Open Source. Available at: https://react.dev/

[5] Wood, G. (2014). Ethereum: A Secure Decentralised Generalised Transaction Ledger. Ethereum Yellow Paper.

[6] Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.