Neural Nexus’

BREACH BLOCK

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Introduction:

Strengthening System Security through AI

In today’s interconnected world, robust system security is paramount. Leveraging Artificial Intelligence (AI), this project focuses on implementing advanced features to monitor, protect, and respond to potential security threats effectively.

PROBLEM STATEMENT

AI-Driven Data Breach Detection ToolProblem Statement: Data breaches often go unnoticed until significant damage is done.Challenge: Develop an AI-powered tool that detects early signs of data breaches and logs all activities on a blockchain for transparency.

AI monitors data access patterns to identify suspicious activity.

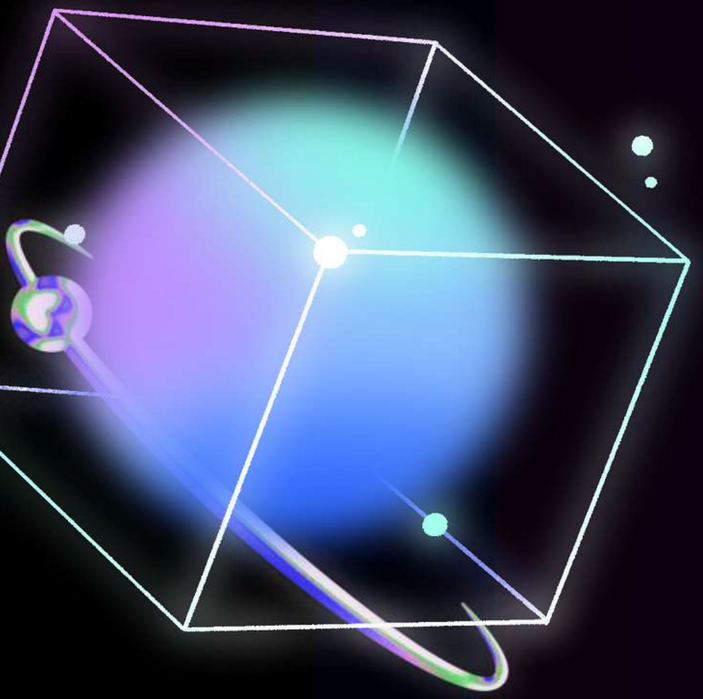
Blockchain creates a tamper-proof log of all data access events.

The system sends alerts to users about potential breaches.Simplified Scope:

Focus on anomaly detection using basic AI techniques.

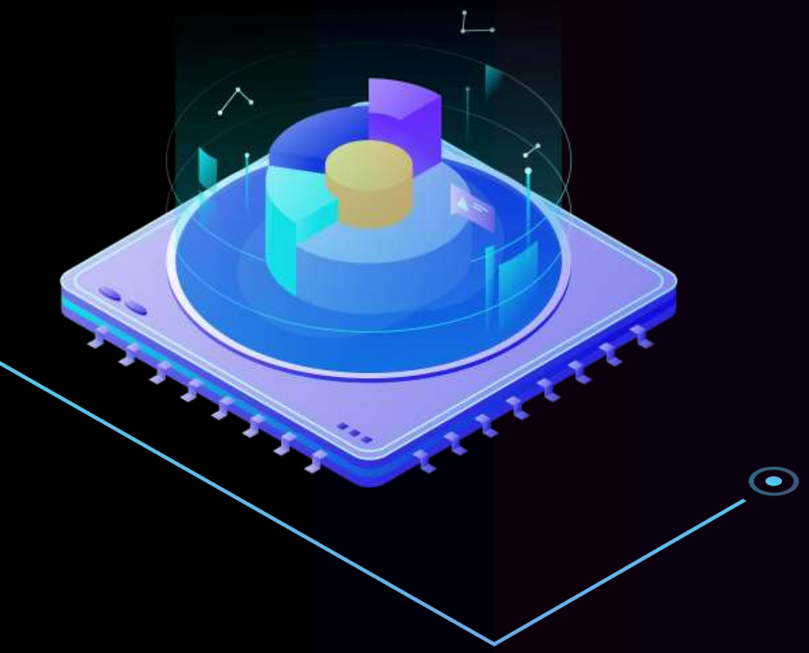
Blockchain logs events for audit and transparency.

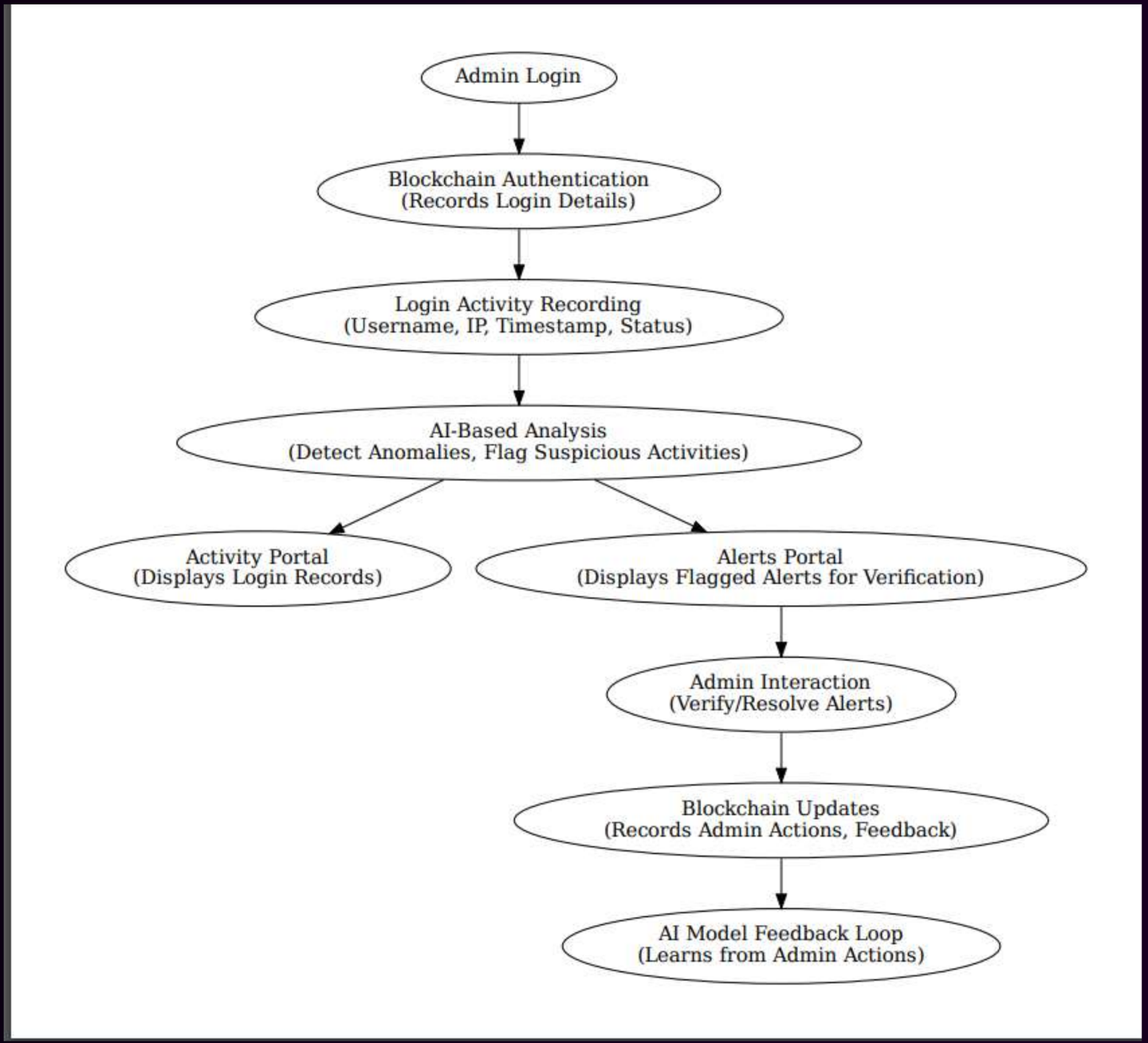
KEY FEATURES



BLOCKCHAIN	ARTIFICIAL INTELLIGENCE
Log Activity Location Tracking Immutable Logs Modification Tracking Smart Contracts	Spike in Data Access from Unknown Ips Login Failure Tracking: IP Tracking Timing Tracking: Data Integrity Monitoring Attack Pattern Analysis

TECHNICAL APPROACH





TECHNOLOGY STACK

BLOCKCHAIN

Solidity is a programming language for creating smart contracts on Ethereum. It enables automated execution of agreements and ensures decentralized, immutable records. while features like inheritance and modifiers enhance code efficiency and security.

Ganache

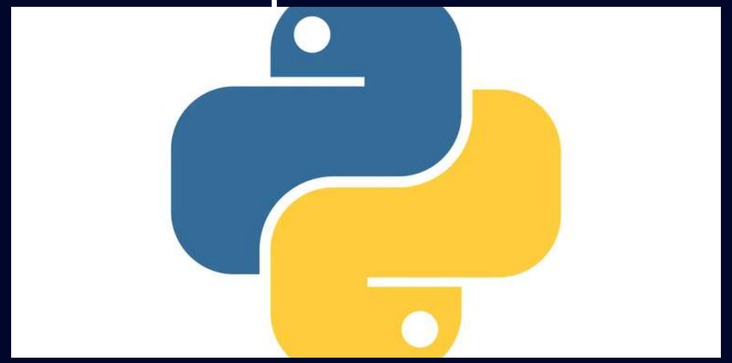
Ganache is a blockchain emulator for Ethereum, allowing developers to test and debug smart contracts in a controlled environment. It provides quick deployments, simulated accounts with pre-funded Ether, and detailed transaction logs for troubleshooting.

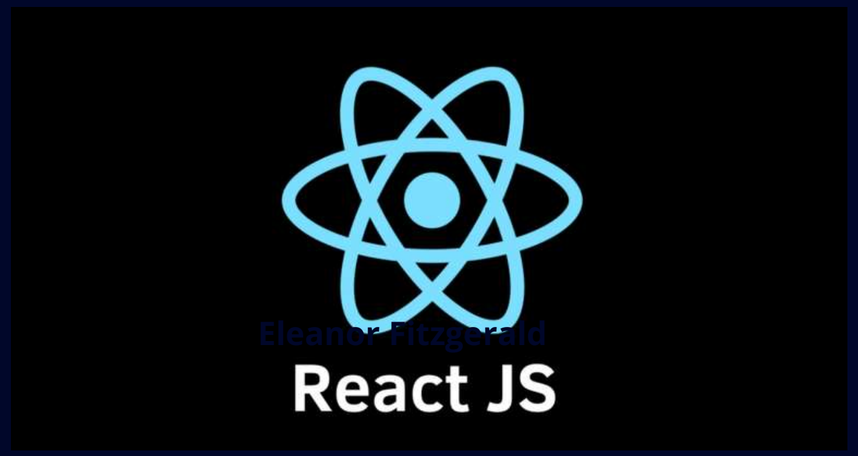
TRUFFLE

Truffle is a development framework for blockchain. It provides tools for contract compilation, automated testing, and migration, streamlining the creation of decentralized applications on Ethereum.

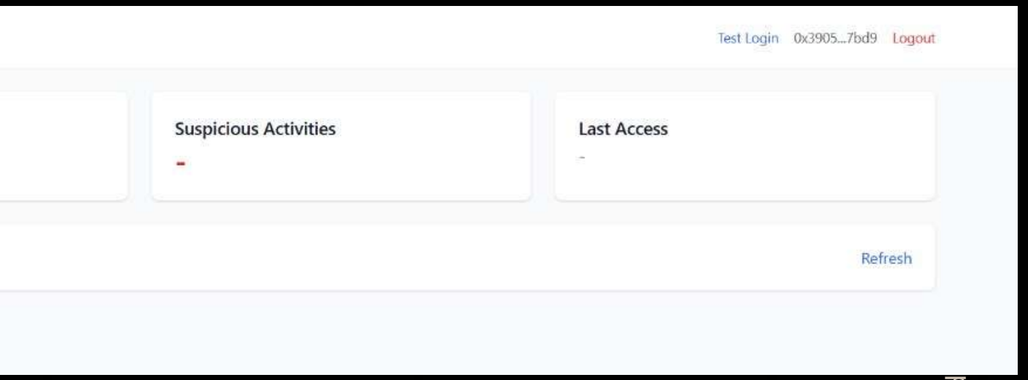
MetaMask is a browser extension that enables users to securely manage their cryptocurrency and interact with decentralized applications (dApps) on Ethereum. It simplifies transactions, storing private keys, and connecting to blockchain networks directly from a web browser.

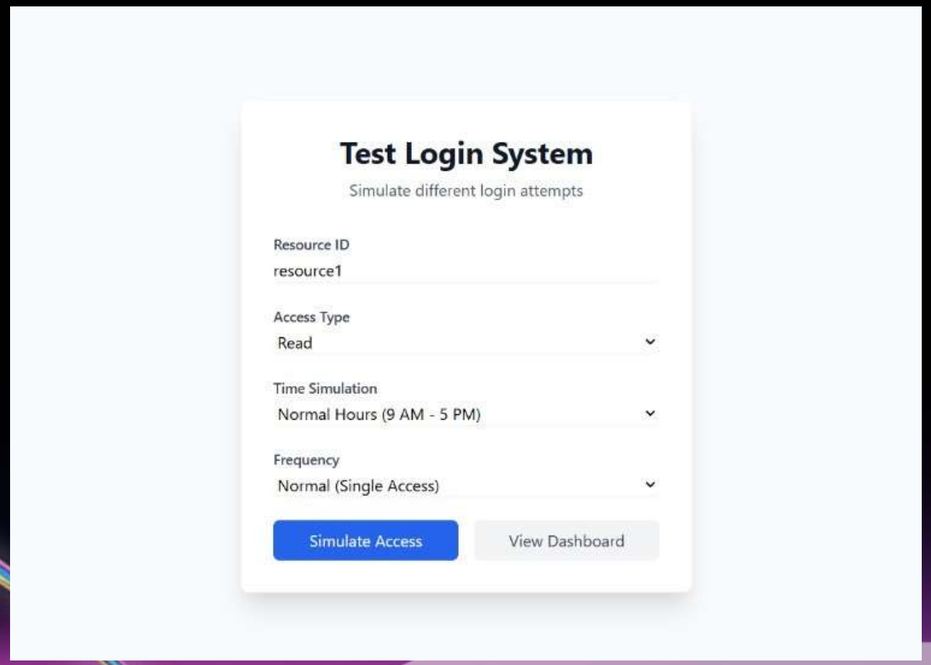
ARTIFICIAL INTELLIGENCE

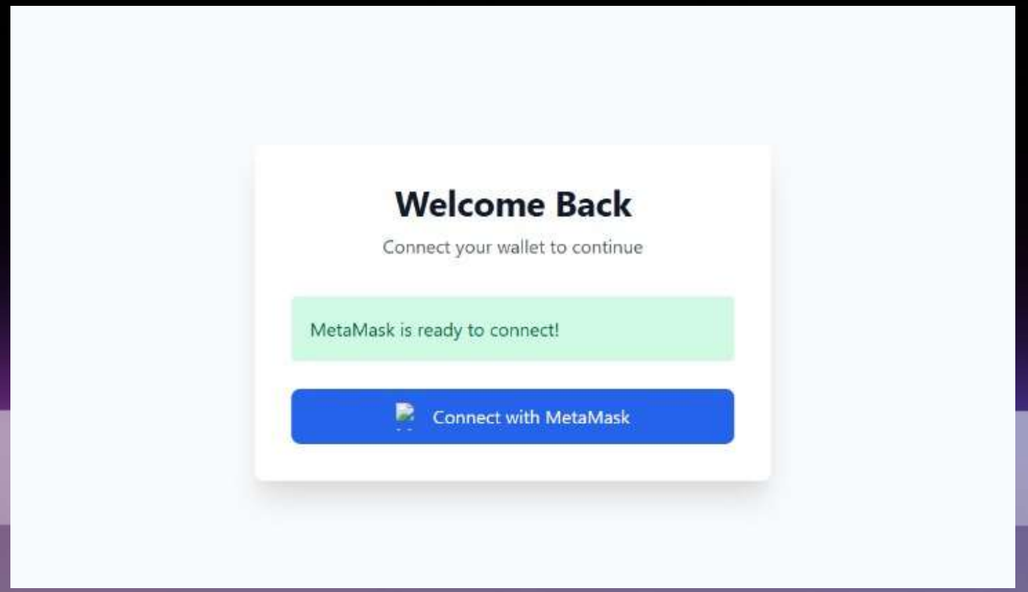




DASHBOARD Highlights







FEASIBILTY

AI for Anomaly Detection:	AI-based anomaly detection for identifying suspicious data access patterns is a well-established field. Techniques such as supervised/unsupervised machine learning and statistical analysis can be used. Tools like Python's Scikit-learn, TensorFlow, or PyTorch make this feasible.
Blockchain Logging	Implementing blockchain for tamper-proof logging is technically achievable using existing platforms like Ethereum, or private blockchains. Smart contracts can automate the logging process.
Integration:	Combining AI with blockchain may present integration challenges but is feasible using middleware solutions or API-based approaches.

VIABILTY

Market Viability

Increasing data breaches and growing concerns about cybersecurity make this solution highly relevant.
Demand exists from enterprises, especially in industries like finance, healthcare, and e-commerce.

Scalability

Scalable with cloud-based AI and distributed blockchain networks.
Adding advanced AI models and expanding blockchain nodes can support growth.

Integration

Transparency through blockchain builds trust with users and organizations.
The tool’s utility in providing early breach warnings addresses a critical pain point, encouraging adoption.

REFRENCES AND CONSTRAINTS:

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2. C. Dannen, *Introducing Ethereum and Solidity: Foundations of Cryptocurrency and Blockchain Programming for Beginners*. Berkeley, CA: Apress, 2017. [Online]. Available: https://www.researchgate.net/publication/315378297_Introducing_Ethereum_and_Solidity. [Accessed: Jan. 12, 2025].
3. K. Ansar, M. Ahmed, M. Helfert, and J. Kim, "Blockchain-Based Data Breach Detection: Approaches, Challenges, and Future Directions," Mathematics, vol. 12, no. 1, pp. 107, Dec. 2023. doi: 10.3390/math12010107.

THANK-YOU!!!