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About the Company

Web3Assam is a dynamic community initiative driving blockchain education and adoption across Northeast India. Dedicated to empowering local talent, it serves as a collaborative hub for developers, entrepreneurs, and enthusiasts to explore the decentralized web. Through workshops, hackathons, and networking events, Web3Assam equips participants with essential Web3 skills, fostering innovation within the region. By bridging the gap between traditional technology and emerging digital frontiers, the initiative aims to position Assam as a significant contributor to the global Web3 ecosystem, unlocking new economic opportunities and technological growth for the state.

Problem Statement

Ethereum transactions require users to pay gas fees for every on-chain action. In applications with frequent or multi-step interactions, this leads to high costs, poor UX, and onboarding friction—especially for new users who must hold native tokens and approve multiple transactions.

Gas optimization techniques such as transaction batching and meta-transactions reduce this friction by allowing user actions to be signed off-chain and executed on-chain by relayers. By batching multiple actions into a single transaction and optionally sponsoring gas fees, applications can lower costs, improve scalability, and abstract blockchain complexity from users.

This problem focuses on building a Gas Fee Optimizer and Batch Transaction System that demonstrates these patterns using relayer contracts, meta-transactions, and optional gas sponsorship mechanisms.

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Expected Deliverables and Weightage

I. System Architecture Design (20%):
Explanation of batching flow, relayer role, trust model, and gas optimization approach.

2.Smart Contract Implementation (30%):
Solidity contracts for batching, signature verification, nonce/ replay protection, and execution.

3.Meta-Transaction Support (15%):
Off-chain signing and on-chain execution via relayers without direct user gas payment.

4.Optional Gas Sponsorship Logic (10%):
Mechanism for full or partial gas subsidization with clear constraints.

5.Frontend / Interaction Layer (10%):
Minimal UI or script showing user signing and relayed batch execution.

6.Documentation (10%): README covering setup, assumptions, limitations, and security considerations.

7. Testing and Validation (5%) Tests or scripts demonstrating correctness and gas savings.

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Evaluation Criteria

Technical Correctness:
Accurate batching, signature checks, and failure handling

Gas Efficiency:
Measurable gas savings over single-transaction execution

Security:
Replay protection, safe relayer assumptions, robust contract design

User Experience:
Reduced wallet prompts and clear abstraction of gas costs

Architecture Quality:
Modularity, scalability, and real-world applicability

Documentation Quality:
Clear, complete, and developer-friendly