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(57) Abstract :

A multi-layer biometric voting system is disclosed to prevent voter impersonation and enhance the integrity of elections. The system integrates five sequential layers of voter identity verification, including Aadhaar-based fingerprint authentication, facial recognition, dynamic OTP validation, EPIC (voter ID) matching, and geofencing. Each layer independently authenticates the voter using secure government and biometric data. A centralized backend system logs verification steps and enables audit trails. The architecture comprises a secure admin portal, voter terminal, and live status dashboard. This invention addresses critical vulnerabilities in existing EVM and VVPAT-based voting methods, especially impersonation and booth capturing, enabling a tamper-resistant, transparent, and scalable voting process suitable for Indian electoral infrastructure.

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