Virtual Ballot: A Secure Online Voting System for India

**Abstract**

The Virtual Ballot System is a technologically advanced solution designed to enhance the security, transparency, and efficiency of electoral processes. This system integrates **secure authentication mechanisms**, including **one-time password (OTP) verification and simulated biometric authentication**, to ensure that only authorized voters can participate. To uphold voter privacy, it employs **AES-256 and RSA encryption protocols**, effectively decoupling voter identity from cast ballots.

To mitigate electoral fraud, the system leverages **artificial intelligence (AI) for anomaly detection**, identifying irregular voting patterns and preventing duplicate submissions. Its **cloud-based architecture** facilitates **scalability**, making it suitable for elections of varying sizes while maintaining system reliability. A **user-friendly interface**, developed using **Java Swing**, ensures accessibility and ease of use for both administrators and voters.

Furthermore, the system implements **role-based access control**, wherein election administrators oversee the voting process while voters are limited to ballot submission. To ensure **electoral transparency and auditability**, **secure logging mechanisms** generate verifiable records for post-election review. Integrating state-of-the-art security measures and user-centric design, the Virtual Ballot System provides a robust, scalable, and transparent framework for modern digital elections.