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A Comprehensive Review on Secure Online Election Management Systems Using Facial Recognition Authentication

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Abstract: *The growing reliance on digital platforms for governance has increased the demand for secure and transparent electronic voting systems. Traditional voting processes that depend on manual verification and paper ballots often face challenges such as impersonation, vote manipulation, and delayed result compilation. To overcome these issues, online election management systems have emerged as a modern alternative, offering convenience and efficiency. However, ensuring voter authenticity and preventing fraudulent activities remain major concerns. This paper presents a comprehensive review of secure online election management systems that incorporate facial recognition authentication. The study explores the integration of biometric verification with web-based voting architectures to enhance election security, reliability, and accessibility. It analyzes various existing approaches, focusing on system design, authentication techniques, data security, and user experience. The paper also highlights the role of Python-based frameworks, image processing algorithms, and encrypted databases in building robust e-voting environments. Through this review, an effort has been made to outline the advantages, limitations, and potential improvements of facial recognition–enabled election systems, emphasizing their importance in achieving fair and trustworthy digital elections.*

Keywords: Online Election Management, Facial Recognition, Biometric Authentication, Digital Voting, E-Governance

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