

Preventing Financial Fraud in Net Banking with AI and Face Recognition Technology

B. Venkatesh M.E., R. Santhosh, P. Shiyam

Assistant Professor, Department of Information Technology Students,

B.Tech., Final Year, Department of Information Technology

Anjalai Ammal Mahalingam Engineering College, Thiruvavur, India.

venkateshaamec@gmail.com, santhoshravi7503@gmail.com, shiyam9904@gmail.com

Abstract: *Online banking has revolutionized financial transactions by offering unmatched convenience, yet it continues to face persistent security challenges. Existing security mechanisms such as One-Time Passwords (OTPs), smart cards, and USB tokens, though widely adopted, have notable limitations. OTPs can be intercepted, while smart cards and tokens are susceptible to loss, theft, and misuse, making them less reliable for robust security. This project proposes a next-generation Net Banking security framework that integrates **real-time facial biometrics** to address these vulnerabilities. By combining **facial recognition with the Grassmann algorithm**, the system delivers a **scalable, cost-effective, and efficient user authentication solution** superior to traditional biometric methods like fingerprint and iris recognition. Furthermore, the system enhances PIN security through an innovative **Illusion View-based PIN identification and verification mechanism**, significantly reducing the risk of **PIN theft, shoulder surfing, and brute force attacks**. To counter spoofing attempts and ensure the authenticity of users, **liveness detection** is embedded into the facial recognition module. This prevents unauthorized access by effectively distinguishing live users from fraudulent attempts using printed images or static photos. Through the convergence of facial biometrics, PIN obfuscation, and liveness verification, this system aims to establish a **multi-layered security model** that addresses current weaknesses in Net Banking authentication. It offers a **more secure, user-friendly, and fraud-resistant** alternative to conventional card- and PIN-based methods, thereby fortifying online banking against evolving cyber threats.*

Keywords: Multi-factor authentication (MFA), Phishing attacks, Photo/video spoofing, Artificial Intelligence (AI), Machine learning (ML), Image-based authentication, PIN obfuscation, Illusion PIN, Liveness detection, Real-time user authentication, Spoofing resistance, Secure PIN entry, Continuous authentication

