

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202611026663 A

(19) INDIA

(22) Date of filing of Application :06/03/2026

(43) Publication Date : 01/05/2026

(54) Title of the invention : Multi-Factor Authentication System Using Behavioral Biometrics

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(32) Priority Date	:NA	
(33) Name of priority country	:NA	
(86) International Application No	:	
Filing Date	:01/01/1900	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

Behavioral biometrics is an identification method that examines the distinctive patterns in a user's activities—such as mouse movements, touchscreen interactions, and typing velocity—to confirm their identity. Fraudsters and cybercriminals are increasingly targeting genuine users through malware, phishing, and social engineering schemes to get passwords and usurp their accounts for nefarious purposes. Identity assaults, including credential theft, phishing, spoofing, and replay, are growing common, compromising the effectiveness of MFA. Despite enhancements in security through knowledge-, possession-, and biometric-based methods, they remain susceptible to theft, unpredictability, and usability challenges. Despite the potential of behavioral biometrics, they are limited by elevated surveillance expenses, neuromotor variability, and catastrophic forgetting in adaptive AI systems. The cognitive-behavioral MFA framework combines procedural memory traits with accessible credentials to create a strong, low-latency, neuroinspired authentication mechanism. As a result, it addresses the limitations of conventional and behavioral systems, hence offering secure and adaptive human–AI authentication frameworks.

No. of Pages : 11 No. of Claims : 5