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Intelligent Fingerprint Recognition System Using Machine Learning

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Abstract: *Secure authentication relies heavily on fingerprint recognition systems; however, conventional techniquesare hindered by differences in image quality and possible security breaches. This study suggests a novel method for improving fingerprint recognition accuracy and robustness that makes use of machine learning techniques. By utilizing convolutional neural networks' (CNNs') capacity to deduce intricate patterns andrepresentations from fingerprint photos, we investigate the use of CNNs for feature extraction and matching. Comparing our experimental results against conventional approaches, we find considerable improvements in accuracy and false acceptance rates on benchmark datasets. By advancing biometric authentication technologies, this research helps to improve security and dependability for a range of applications in law enforcement, access control, and personal identification.*

Keywords: Fingerprint recognition, machine learning, CNNs, biometrics, authentication, security, feature extraction, pattern recognition, accuracy, false acceptance rate (FAR).