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(51) International classification	:G06N 3/04, G06N 3/08, H04L 9/32, G06F 21/32, H04L 9/06	(71) <b>Name of Applicant :</b> <b>1)Swami Rama Himalayan University</b> Address of Applicant :Swami Rama Himalayan University, Swami Ram Nagar, Jolly Grant, Dehradun-248016 Dehradun Uttarakhand India
(31) Priority Document No	:NA	(72) <b>Name of Inventor :</b> <b>1)Dr. Pramod Kumar</b>
(32) Priority Date	:NA	<b>2)Dr. Deepak Srivastava</b>
(33) Name of priority country	:NA	<b>3)Vibhor Sharma</b>
(86) International Application No	:	<b>4)Dr. Dheresh soni</b>
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(57) Abstract :

The present invention relates to biometric authentication and cryptographic security, integrating deep neural fusion with blockchain technology. A multimodal biometric acquisition module concurrently captures vein, facial, and palm data via near-infrared, multi-camera, and multispectral sensors. A preprocessing module normalizes and refines the captured images prior to feature extraction by modality-specific deep neural network modules. The extracted high-dimensional feature vectors are fused in a transformer-based deep neural fusion module using an attention mechanism and a session-specific random salt to yield a unified biometric signature. This signature is converted into a non-reversible BIO-KEY by the cryptographic key generation module and securely recorded on a tamper-resistant blockchain ledger via a blockchain enabled identity verification module.

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