Executive summary of Minor Research Project

Name of the Principal Investigator: **A VANAJA**

Title of research project**: An Effective Comparison of Different Multimodal Biometric Recognition System for Secure Person Authentication Using Score - Level Fusion Approach.**
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Personal identification and authentication is very crucial in the current scenario. Biometrics plays an important role in this area. It provides a guaranteed level of accuracy and consistency over traditional methods. Biometrics means "The statistical analysis of biological observations and phenomena". It refers to the use of physical (e.g., fingerprint, palm vein, face, iris, retina, hand geometry) and behavioural (e.g., gait, signature, speech) characteristics for reorganization of an individuals.

Biometric systems are of two types: unimodal and multimodal. The unimodal use only single trait like fingerprint, palm vein, iris, face and retina (physiological trait) or gait, voice, handwritten (behavioral trait) to verify the person. In this model, if the biometrics feature is stolen, it cannot be replaced for further security. Also, the damaged biometrics leads to wrong predation. To overcome this difficulty, this work focuses on using the multimodal biometrics. The main focus is on using the biometrics such as palm vein, iris and retina. The features for the biometrics are extracted by using the Fisherface. Various combinations of biometrics used in this system are palm vein and iris, palm vein and retina, iris and retina. The system has been implemented using MATLAB.

Using Match-score level fusion technology, Features extracted from individual biometric modalities are first matched to compute the corresponding match scores. The scores obtained from different biometric systems are then combined to generate a fused match score. Then system was evaluated using the parameters such as False Rejection Rate (FRR) and False Acceptance Rate (FAR). The experiments are conducted to evaluate the performance of various combinations of biometrics. The palm vein and iris system obtains FRR of 88.5% and FAR of 0.26%. The palm vein and retina system obtains FRR of 85.2% and FAR of 0.16%. The iris and retina system obtains FRR of 84.1% and FAR of 0.08%. The comparison results are shown in Table below.

SYSTEMS	FRR	FAR
Iris and Retina	84.1%	0.08%
Palm vein and Retina	85.2%	0.16%
Palm vein and Iris	88.5%	0.26%

From the results, it is observed that the usage of multimodal biometrics with iris and retina results in better security than other combinations.