Abstract

Biometric based Personal authentication is still active research problem due to various issues such as providing high accuracy, computationally less complex feature extraction method and fusion strategy of multiple feature information. In this work we propose a personal authentication system using one such hand based biometric trait, Finger Back Knuckle Surface (FBKS). The texture pattern produced by the finger back knuckle intact surface is highly unique and makes the surface a distinctive biometric identifier. In comparison with existing approaches, which do not extract any angular data as feature information, this method extracts angular information using geometric analysis based on Tangents and Secants. This system acquires knuckle images using automated low resolution contact less method. In this, image pattern of both primary knuckle and core knuckle is completely considered as a Intra knuckle parameters of Finger back knuckle intact surface. The feature information of FBKS various fingers such as Left Index Finger, Left Middle Finger, Right Index Finger and Right middle Finger are extracted and fused using matching score level fusion. The experiments were conducted using newly created database for FBKS consists of samples collected from 100 volunteers. The experimental results from the proposed approach are promising and confirm
the usefulness of such an approach for personal authentication.

References

- Ajay Kumar, Senior Member, IEEE, and Ch. Ravikanth "Personal Authentication Using Finger Knuckle Surface"; IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY, VOL. 4, NO. 1, MARCH 2009.
- Goh Kah Ong Michael and Tee Connie, Andrew Teoh Beng Jin Robust Palm Print and Knuckle Print Recognition System Using a Contactless Approach, 2010 IEEE.
- Abdallah Meraoumia1, Salim Chitroub1 and Ahmed Bouridane2, Fusion of Finger-Knuckle-Print and Palmprint for an Efficient Multi-biometric System of Person Recognition, 2011 IEEE
- Ajay Kumar, Member, IEEE, and David Zhang, Senior Member, IEEE,"Personal Recognition Using Hand Shape and Texture"; IEEE TRANSACTIONS ON IMAGE PROCESSING, VOL. 15, NO. 8, AUGUST 2006
- Hafiz Imtiaz and Shaikh Anowarul Fattah, "A DCT-based Feature Extraction Algorithm for Palm-print Recognition"; 2010 IEEE.
- David Zhang, Senior Member, IEEE, Wai-Kin Kong, Member, IEEE, Jane You, Member, IEEE, and Michael Wong "Online Palmprint Identification"; IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE, VOL. 25, NO. 9, SEPTEMBER 2003.
- Vivek Kanhangad, Ajay Kumar, Senior Member, IEEE, and David Zhang, Fellow, IEEE "A Unified Framework for Contactless Hand Verification"; IEEE TRANSACTIONS ON IMAGE PROCESSING, VOL. 15, NO. 8, AUGUST 2006.
- Kumar, Senior Member, IEEE, and Ch. Ravikanth "Personal Authentication Using Finger Knuckle Surface"; IEEE TRANSACTIONS ON INFORMATION FORENSICS AND SECURITY, VOL. 4, NO. 1, MARCH 2009.
A Geometric Approach for Personal Authentication based on Finger Back Knuckle Surface using Tangents and Secants

9, September 2009.

Index Terms
Computer Science
Pattern Recognition

Keywords
Edge Detection
Tangents And Secants
Angular Information
Matching Score Level
Correlation
Fusion
Coefficient