

All fields Author
 Journal/Book title Volume Issue Page

[Advanced search](#)
[Search tips](#)

Font Size: **A** **A**

[Purchase PDF \(887 K\)](#) [Export citation](#)

Abstract | [References](#)

Digital Signal Processing
 Volume 20, Issue 4, July 2010, Pages 1264-1273

doi:10.1016/j.dsp.2009.12.002 | [How to Cite or Link Using DOI](#)
 Copyright © 2009 Elsevier Inc. All rights reserved.

[Permissions & Reprints](#)

Cited By in Scopus (0)

Fingerprint verification using statistical descriptors

Mohammed S. Khalil^a, , Dzul kifli Mohamad^a, Muhammad Khurram

Khan^b, and Qais Al-Nuzali^a [\[Author vitae\]](#)

^a Department of Computer Graphics and Multimedia, Universiti Teknologi Malaysia, Johor, Malaysia

^b Center of Excellence in Information Assurance (CoEIA), King Saud University, Saudi Arabia

Available online 16 December 2009.

Abstract

The importance of high precision matching in fingerprint cannot be over-emphasized. This paper presents a novel fingerprint verification algorithm which improves matching accuracy by overcoming the shortcomings of poor image quality. The proposed method involves determination of a singular point using orientation field reliability, extraction of a square-sub-image (SSI); 129×129 pixels, statistical analysis of the co-occurrence matrices as well as application of dual analyses on experimental results; Pattern Recognition and Image Processing Laboratory (FVC2002) testing protocol and Program for Rate Estimation and Statistical Summaries (PRESS). The efficiency of the proposed method has been demonstrated by the experimental results which show equal error rate (EER) of 28% and a comparatively more accurate and robust means for reliable fingerprint verification.

Keywords: Fingerprint; Statistical analysis; Biometrics; Singular point; Reliability

Corresponding author. Fax: +60 75536668.

Vitae



Mohammed Sayim Khalil is a Ph.D. Candidate in Computer Science at the Universiti Teknologi Malaysia, Malaysia. He received his Bachelor of Science in Computer Science Magna Cam Lade in 1987 at National University, CA, USA and a Master of Science in Computer Science in 2006 from Sudan University for Science & Technology, Khartoum, Sudan. In 2006, he started his Ph.D. in Computer Science at the Department of Computer Graphics and Multimedia, UTM. His research interests include pattern recognition and biometric systems (fingerprint classification and recognition, signature verification, face recognition). He is a lecturer at Sana'a University since 1988 up to now. He is also a student member of IEEE and a reviewer for several international journals and conferences.



Dr. Dzul kifli bin Mohamad is now a Professor at the University of Technology Malaysia. He received his Bachelor of Science from National University of Malaysia in 1978, a Postgraduate Diploma from the University of Glasgow, UK in 1981, a Master of Science from the University of Technology Malaysia in 1990 and Ph.D. from the University of Technology Malaysia in 1997. He held different positions at UTM. He is a consultant for different firms. He supervised more than 100 master and Ph.D. students. Furthermore, he evaluated/examined more than 200 post-graduates. Dr. Dzul kifli has received variety of awards and published more than 200 research papers in the international journals and conferences. His areas of interest are biometrics, pattern recognition, multimedia signal processing.



Dr. Muhammad Khurram Khan is currently working as Assistant Professor at Center of Excellence in Information Assurance (CoEIA), King Saud University, Saudi Arabia. He is the Founding Editor of 'Bahria University Journal of Information & Communication Technology' (BUJICT). He also plays a role of Editor of several international journals of Elsevier Science and Springer-Verlag. He has been the Program Chair and Publication Chair of the 12th IEEE International Multitopic Conference (INMIC'08). He has also been the Program Chair of the IEEE International Symposium on Biometrics & Security Technologies (ISBAST'08). He has worked as General Chair for the International Workshop on Frontiers of Information Assurance and Security (FIAS'09), Australia. Furthermore, he performed duties of Publicity Co-Chair of the 6th International Conference on Intelligent Computing (ICIC'10), Publicity Co-Chair of the 5th International Conference on Intelligent Computing (ICIC'09), International Conference on Security Technology (SecTech'09),

Related Articles

- [An efficient quantization technique for wavelet coeffic...
Signal Processing](#)
- [Chaos and NDFT-based spread spectrum concealing of fing...
Digital Signal Processing](#)
- [Detection and classification of masses in breast ultras...
Digital Signal Processing](#)
- [A 2-phase 2-D thresholding algorithm
Digital Signal Processing](#)
- [Enhancement and feature purification of fingerprint ima...
Pattern Recognition](#)

[View more related articles](#)

Related reference work articles e.g. encyclopedias

- [CHEMOMETRICS AND STATISTICS | Signal Processing
Encyclopedia of Analytical Science](#)
- [PHOTOGRAPHY AND DIGITAL IMAGING | Overview
Encyclopedia of Forensic Sciences](#)
- [Signal Processing, Digital
Encyclopedia of Physical Science and Technology](#)
- [SIGNAL PROCESSING, MODEL BASED METHOD
Encyclopedia of Vibration](#)
- [INFORMATION PROCESSING | Optical Digital Image Processi...
Encyclopedia of Modern Optics](#)

[More related reference work articles](#)

[View Record in Scopus](#)