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Fingerprint verification using statistical descriptors

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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

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Vitae

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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),