A fast and distortion tolerant hashing for fingerprint image authentication

Le T.H., Bui T.D.

Faculty of Information Technology, Vietnam National University, Hanoi, Viet Nam

Abstract: Biometrics such as fingerprint, face, eye retina, and voice offers means of reliable personal authentication is now a widely used technology both in forensic and civilian domains. Reality, however, makes it difficult to design an accurate and fast biometric recognition due to large biometric database and complicated biometric measures. In particular, fast fingerprint indexing is one of the most challenging problems faced in fingerprint authentication system. In this paper, we present a specific contribution to advance the state of the art in this field by introducing a new robust indexing scheme that is able to fasten the fingerprint recognition process. © 2009 Springer-Verlag Berlin Heidelberg.
Author Keywords: Error correcting code; Fingerprint authentication; Fingerprint hashing; Image authentication

Authors with affiliations:

• Le, T.H., Faculty of Information Technology, Vietnam National University, Hanoi, Viet Nam

• Bui, T.D., Faculty of Information Technology, Vietnam National University, Hanoi, Viet Nam

References:

• Bazen, A.M., Gerez, S.H., Fingerprint matching by thin-plate spline modeling of elastic deformations (2003) Pattern Recognition, 36, pp. 1859-1867

• Bazen, A.M., Verwaaijen, G.T.B., Garez, S.H., Veelunturf, L.P.J.: A correlation-based fingerprint verification system. In: ProRISC 2000 Workshops on Circuits, Systems and Signal Processing (2000)Boer, J., Bazen, A., Cerez, S., Indexing fingerprint database based on multiple features (2001) ProRISC 2001 Workshop on Circuits, Systems and Singal Processing

- Brown, L., (1992) A survey of image registration techniques, , ACM Computing Surveys
- Cappelli, R., Lumini, A., Maio, D., Maltoni, D., Fingerprint Classification by Directional Image Partitioning (1999) IEEE Trans. on PAMI, 21 (5), pp. 402-421
- Cappelli, R., Maio, D., Maltoni, D., Indexing fingerprint databases for efficient 1: N matching (2000) Sixth Int.Conf. on Control, Automation, Robotics and Vision, , Singapore
- Choudhary, A.M., Awwal, A.A.S., Optical pattern recognition of fingerprints using distortion-invariant phase-only filter (1999) Proc. SPIE, 3805 (20), pp. 162-170
- Fingerprint verification competition, , http://bias.csr.unibo.it/fvc2002
- Germain, R., Califano, A., Colville, S., Fingerprint matching using transformation parameter clustering (1997) IEEE Computational Science and Eng, 4 (4), pp. 42-49
- Gonzalez, W., (2004) Eddins: Digital Image Processing, , Prentice Hall, Englewood Cliffs
- Jain, A., Ross, A., Prabhakar, S., Fingerprint matching using minutiae texture features (2001) International Conference on Image Processing, pp. 282-285
- Jain, A., Prabhakar, S., Hong, L., Pankanti, S., Filterbank-based fingerprint matching (2000) Transactions on Image Processing, 9, pp. 846-859
- Jain, A.K., Prabhakar, S., Hong, L., Pankanti, S., FingerCode: A filterbank for fingerprint representation and matching (1999) CVPR IEEE Computer Society Conference (2), pp. 187-193
- Jea, T., Chavan, V.K., Govindaraju, V., Schneider, J.K., (2004) Security and matching of partial fingerprint recognition systems, pp. 39-50. , SPIE
- Tsai-Yang, J., Venu, G., A minutia-based partial fingerprint recognition system (2005) Pattern Recognition, 38 (10), pp. 1672-1684
- Karu, K., Jain, A.K., Fingerprint Classification (1996) Pattern Recognition, 18 (3), pp. 389-404
- Ke, Y., Sukthankar, R., Huston, L., An efficient parts-based near duplicate and sub-image retrieval system (2004) MM International Conference on Multimedia, pp. 869-876
- Liang, X., Asano, T., B.: Distorted Fingerprint indexing using minutiae detail and delaunay triangle. In: ISVD 2006, pp. 217-223 (2006)Maio, D., Maltoni, D., Cappelli, R., Wayman, J.L., Jain, A.K., FVC, Third Fingerprint Verification Competition (2004) Proc. ICBA, pp. 1-7. , Hong Kong, July, 2004
- Nandakumar, K., Jain, A.K., Local correlation-based fingerprint matching (2004) Indian Conference on Computer Vision, Graphics and Image Processing, pp. 503-508
- Nist fingerprint vendor technology evaluation, , http://fpvte.nist.gov
- Ruud, B., Connell, J.H., Pankanti, S., Ratha, N.K., Senior, A.W., (2003) Guide to Biometrics, , Springer, Heidelberg
- Liu, T., Zhang, G.Z.C., Hao, P., Fingerprint Indexing Based on Singular Point Correlation (2005) ICIP 2005