References

Abaza, A. and Ross A. (2009). Quality Based Rank-Level Fusion in Multibiometric Systems. in *Proc. of 3rd IEEE International Conference on Biometrics: Theory, Applications and Systems* (BTAS'09), pp. 1-6, Washington DC, USA.

Abiyev, R.H. and Altunkaya, K. (2008). Personal Iris Recognition Using Neural Network. *Int. J. Security and its Applications* **2**(2):41-50.

Adler, A. (2003). Sample images can be independently restored from face recognition templates. in *Proc. of Canadian Conference on Electrical and Computer Engineering* **2**, pp. 1163-1166, Montreal, Canada.

Akritas, A.G., Malaschonok, G.I. and Vigklas, P.S. (2006). The SVD-Fundamental Theorem of Linear Algebra. *Nonlinear Analysis: Modeling and Control* **11**(2):123–136.

ANSI 1506. (2006). Information technology–Biometrics: Multimodal and Other Multibiometric Fusion. ISO/IEC PDTR 24722:2007.

Araghi, L.F., Shahhosseini, H. and Setoudeh, F. (2010). IRIS Recognition Using Neural Network. in *Proc. of International MultiConference of Engineers and Computer Scientists* 1, Hong Kong.

ATVS (2007). MCYT-score database. Biometric Recognition Group – ATVS, Universidad Autonoma de Madrid, SPAIN. [URL] http://atvs.ii.uam.es/mcytscores.html.

BBC News. Long Lashes Thwart ID Scan Trial. [URL] http://news/bbc.co.uk/2/hi/uk_news/politics/3693375.stm.

Begum, S.A. and Meetei, T.C. (2011). Information Fusion in Multimodal Biometric Systems, *Assam University Journal of Science and Technology* **8**(II):21-31.

Benaliouche, H. and Touahria, M. (2014). Comparative Study of Multimodal Biometric Recognition by Fusion of Iris and Fingerprint. *The Scientific World Journal* **2014**:1-13.

Bendjebbour, A., Delignon, Y, Fouque, L., Samson, V. and Pieczynski, W. (2001). Multi-sensor Image Segmentation using Dempster Shafer Fusion in Markov Fields Context. *IEEE Transactions on Geoscience and Remote Sensing* **39**(8):1789-1798.

Bengio, S. and Mariëthoz, J. (2004). The Expected Performance Curve: a New Assessment Measure for Person Authentication. in *Proc. of The Speaker and Language Recognition Workshop,* pp. 279-284, Odyssey, Toledo.

Bera, C., Bhattacharjee, D. and Nasipuri, M. (2015). Fusion-Based Hand Geometry Recognition Using Dempster-Shafer Theory. *International Journal of Pattern Recognition and Artificial Intelligence* 29(5):1556005(1-24).

Bishop, C.M. (2006). *Pattern Recognition and Machine Learning*. Springer Science and Business Media, LLC, NY.

Blum, L., Blum, M. and Shub, M. (1986). A simple unpredictable pseudo-random number generator. *SIAM J. Computer* **15**:364–383.

Boles, W. and Boashash, B. (1998). A human Identification Technique Using Images of the Iris and Wavelet Transform. *IEEE Transactions on Signal Processing* **46**(4):1185-1188.

Bolle, R.M., Connell, J.H. and Ratha, N.K. (2002). Biometric perils and patches. *Pattern Recognition* **35**(12):2727–2738.

Bolle, R.M., Connell, J.H. and Ratha, N.K., (2002). Biometric perils and patches. *Pattern Recognition* **35**(12):2727–2738.

Burge, M. and Burger, W. (1998). Ear biometrics. in: Jain A., Bolle R., and Pankanti S. (Eds.), *Biometrics: Personal Identification in Networked Society*, 273-286, Kluwer Academic Publishers, London, UK.

Campbell, J.P. (1997). Speaker Recognition: a Tutorial. in *Proc. of the IEEE* **85**(9), pp. 1437-1462.

CASIA, (2006). CASIA Iris image database, Institute of Automation, Chinese Academy of Sciences, [URL] *http://www.cbsr.ia.ac.cn/IrisDatabase.htm*.

Cavoukian, A. and Stoianov, A. (2009). Biometric encryption. in *Encyclopedia of Biometrics*, Springer.

Chandra-Murty, P.S.R. and Reddy, E.S. (2009). Iris Recognition system using Principal Components of Texture Characteristics. *TECHNIA-International Journal of Computing Science and Communication Technologies* **2**(1):343-348.

Chang, K.I., Bowyer, K.W. and Flynn, P.J. (2005). An Evaluation of Multimodal 2D+3D Face Biometrics. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **27**(4):619-624.

Chen, X., Flynn, P.J., and Bowyer, K.W. (2005). IR and Visible Light Face Recognition. *Computer Vision and Image Understanding* **99**(3):332-358.

Cheung, M., Yiu, K., Mak, M. and Kung, S. (2004). Multi-Sample Fusion with Constrained Feature Transformation for Robust Speaker Verification. in *Proc. of 8th International Conference on Spoken Language Processing* (ICSLP2004), pp. 1813-1816, Jeju Island, Korea.

Chibelushi, C.C., Mason, J.S.D. and Deravi, F. (1997). Feature-level Data Fusion for Bimodal Person Recognition. *in Proc. of 6th International Conference on Image Processing and Its Applications* 1, pp. 399-403, Dublin, Ireland.

Chin, Y.J. Ong, T.S., Goh, M.K.O. and Hiew, B.Y. (2009). Integrating Palmprint and Fingerprint for Identity Verification. in *Proc. of 3rd International Conference on Network and System Security*, pp. 437-442, Gold Coast, QLD.

Chitte, P.P., Rana, J.G., Bhambare, R.R., More, V.A., Kadu, R.A., Bendre, M.R. (2012). IRIS Recognition System Using ICA, PCA, Daugman's Rubber Sheet Model Together. *Int. J. Computer Technology and Electronics Engineering* (IJCTEE) **2**(1):16-23.

Cho, S.B. and Kim, J.H. (1995). Combining multiple neural networks by fuzzy integral and robust classification. *IEEE Transactions on Systems, Man, and Cybernetics* **25**:380–384.

Choi, K., Choi, H. and Kim, J. (2005). Fingerprint Mosaicking by Rolling and Sliding. in *Proc. of 5th International Conference on Audio- and Video-Based Biometric Person Authentication* (AVBPA2005), pp. 260-269, Rye Brook, USA.

Chong, S.C., Jin, A.T.B. and Ling, D.N.C. (2006). High security iris verification system based on random secret integration. *Computer Vision and Image Understanding* **102**(2):169–177.

Clancy, T.C., Kiyavash, N., Lin, D.J. (2003). Secure smartcard-based fingerprint authentication. in *Proc. of ACM Multimedia, Biometrics Methods and Applications Workshop* (SIGMM 2003), pp. 45-52, Berkley, CA.

Coltell, O., Badfa, J.M. and Torres, G. (1999). Biometric identification system based on keyboard filtering. in *Proc. of IEEE International Carnanhan Conference on Security Technology*, pp. 203-209.

Connie, T., Teoh, A.B.J., Goh, M. and Ngo, D.C.L. (2005). PalmHashing: A Novel Approach for Cancelable Biometrics. *Information Processing Letters* **93**:1-5.

Darwish, A.A., Abd-Elghafar, R. and Fawzi-Ali, A. (2009). Multimodal Face and Ear Images. *Journal of Computer Science* **5**(5):374-379.

Daugman, J. (2004). How Iris Recognition Works. *IEEE Transactions on Circuits and Systems for Video Technology* **14**(1):21-30.

Daugman, J. (1993). High Confidence Visual Recognition of Persons by a Test of Statistical Independence. *IEEE Transaction on Pattern Analysis and Machine Intelligence* **15**(11):1148-1161.

Daugman, J. (2002). Recognizing Persons by Their Iris Patterns. *The Computer Laboratory*, University of Cambridge, UK.

Daugman, J. (2003). [URL] http://www.cl.cam.ac.uk/~jgd1000/addisadvans.html.

Daugman, J. (2012). Combining Multiple Biometrics. [URL] http://www.cl.cam.ac.uk/users/jgd1000/combine/combine.html.

Davida, G., Frankel, Y. and Matt, B. (1999). On the relation of error correction and cryptography to an off line biometric based identification scheme. in *Proc. of Workshop on Coding and Cryptography*, pp. 129–138.

Dodis, Y., Ostrovsky, R., Reyzin, L., and Smith, A. (2006). Fuzzy Extractors: How to Generate Strong Keys from Biometrics and Other Noisy Data. *Technical Report 235, Cryptology ePrint Archive*, 2006.

Dorairaj, V., Schmid, N., and Fahmy, G. (2005). Performance Evaluation of Iris Based Recognition System Implementing PCA and ICA Techniques. in *Proc. of SPIE 5779: Biometric Technology for Human Identification* II 5779, pp. 51–58.

Drineas, P. and Mahoney, M.W. (2005). On the Nyström Method for Approximating a Gram Matrix for Improved Kernel-Based Learning. *J. Machine Learning Research* 6:2153–2175.

Duda, R.O., Hart, P.E. and Stork and D.G. (2001*). Pattern Classification*. John Wiley & Sons.

FastICA, (2005). FastICA Matlab package. [URL] http://www.cis.hut.fi/projects/ica/fastica.

Fawcett, T. (2006). An introduction to ROC analysis. *Pattern Recognition Letter* **27**: 861–874.

Federal Bureau of Investigation (FBI) (2010). Integrated Automated Fingerprint Identification System. [URL] http://www.fbi.gov/hq/cjisd/iafis.htm.

Feng, Y.C., Yuen, P.C., and Jain, A.K. (2008). A hybrid approach for face template protection. in *Proc. of the SPIE, Biometric Technology for Human Identification* V 6944, pp. 8–11.

Feng, Y.C., Yuen, P.C., and Jain, A.K. (2010). A hybrid approach for generating secure and discriminating face template. *IEEE Trans. Inf. Forensic Secur*. **5**(1):103–107.

Fierrez-Aguilar, J., Garcia-Romero, D., Ortega-Garcia, J. and Gonzalez-Rodriguez, J. (2005). Bayesian adaptation for user-dependent multimodal biometric authentication. *Pattern Recognition* **38**(8):1317–1319.

Fierrez-Aguilar, J., Nanni, L., Lopez-Penalba, J., Ortega-Garcia, J. and Maltoni, D. (2005). An On-line Signature Verification System based on Fusion of Local and Global Information. in *Proc. of 5th International Conference on Audio- and Video-based Biometric Person Authentication* (AVBPA2005)*,* pp. 523-532, Rye Brook, USA.

Fierrez-Aguilar, J., Nanni, L., Ortega-Garcia, J., Cappelli, R. and Maltoni, D. (2004). Combining Multiple Matchers for Fingerprint Verification: A Case Study. in *Roli, F.and Vitulano, S. (Eds.):* ICIAP 2005, LNCS 3617,, pp. 1035–1042.

Fierrez-Aguilar, J., Ortega-Garcia, J., Gonzalez-Rodriguez, J. and Bigun, J. (2005). Discriminative multimodal biometric authentication based on quality measures. *Pattern Recognition* **38**(5):777-779.

Flom, L. and Safir, A. (1987). Iris recognition system. U.S. Patent 4641349.

Frischholz, R. and Dieckmann, U. (2000). BioID: A Multimodal Biometric Identification System. *IEEE Computer* **33**(2):64-68.

George, A. (2008). Bizarre Approaches for Multimodal Biometrics. *International Journal of Computer Science and Network Security* **8**(7):64- 69.

Giot, R., Hemery, B., and Rosenberger, C. (2010). Low Cost and usable Multimodal Biometrics System based on keystroke Dunamics and 2D Face Recognition. in *Proc. of 20th International Conference on Pattern recognition*, pp. 1128-1131.

Goh, A. and Ngo, D.C.L. (2003). Computation of cryptographic keys from face biometrics. in Lioy, A., Mazzocchi, D. (eds.): LNCS 2828, *Proc. of 7th International Conference on Communications and Multimedia Security*, pp. 1–13. Springer, New York

Gokberk, B., Salah, A.A. and Akarun, L. (2005). Rank-Based Decision Fusion for 3D Shape-Based Face Recognition. in *Proc. of LNCS 3546: AVBPA2005*, pp. 1019-1028.

Greenfield, S. and Chiclana, F. (2013). Accuracy and complexity evaluation of defuzzification strategies for the discretised interval type-2 fuzzy set. *International Journal of Approximate Reasoning* **54**(8):1013-1033.

Griffin, P. (2004). Optimal Biometric Fusion for Identity Verification. Technical Report RDNJ-03-0064, *Identix Corporate Research Center*.

Gunsel, B., Uludag, U. and Tekalp, A.M. (2002). Robust watermarking of fingerprint images. *Pattern Recognition* **35**(12):2739–2747.

Hammerle-Uhl, J., Pschernig, E. and Uhl, A. (2009) Cancelable iris biometrics using block re-mapping and image warping. in: Samarati, P., Yung, M., Martinelli, F., Ardagna, C. (eds.) in *Proc. of 12th International Information Security Conference*. LNCS 5735, pp. 135–142, Springer, New York.

Han, J. and Bhanu, B. (2005). Gait Recognition by Combining Classifiers Based on Environmental Contexts. in *Proc. of 5th International Conference on Audio- and Video-Based Biometric Person Authentication* (AVBPA2005), pp. 416-425, Rye Brook, USA.

Hao, F., Anderson, R. and Daugman, J. (2006). Combining Cryptography with Biometrics Effectively. *IEEE Trans. Comput.* **55**(9):1081–1088.

Heijden F.V.D., Duin R.P.W., Ridder D.D. and Tax D.M.J. (2004). Classification, parameter estimation and state estimation: An engineering approach using Matlab, *John Wiley*, UK.

Hill, H., Schyns, P. G., and Akamatsu, S. (1997). Information and Viewpoint Dependence in Face Recognition. *Cognition* **62**(2):201-222.

Ho, T.K., Hull, J.J. and Srihari, S.N. (1994). Decision Combination in Multiple Classifier Systems. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **16**(1):66-75.

Hong, L. and Jain, A.K. (1998b). Integrating faces and fingerprints for personal identification. *IEEE Transactions on Pattern Analysis Machine Intelligence* **20**(12):1295–1307.

Hong, L. and Jain, L. (1997). Automatic Personal Identification by Integrating Faces and Fingerprints. in *Proc. of Workshop on Automatic Identification Advanced Technologies*, pp. 15–18.

Hong, L., Jain, A. and Pankanti, S. (1999). Can Multibiometrics Improve performance? in *Proc. of AutoID'*99, pp. 59-64, Summit, NJ.

Huang, Y., Luo, S., and Chen, E. (2002). An efficient iris recognition system. *International Conference of Machine Learning and Cybernetics* **1**, pp. 450–454.

Huang, Y.S. and Suen, C.Y. (1995). Method of Combining Multiple Experts for the Recognition of Unconstrained Handwritten Numerals. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **17**(1):90-94.

Hyvärinen, A. and Oja, E. (2000). Independent Component Analysis: Algorithms and Applications. *Neural Networks* **13**(4-5):411-430.

Jain, A.K. and Ross, A. (2002a). Learning User-Specific Parameters in a Multibiometric System, in *Proc. of International Conference on Image Processing* (ICIP'2002), Rochester, New York.

Jain, A.K. and Ross, A. (2004c). Multibiometric Systems. *Communications of the ACM*, Special Issue on Multimodal Interfaces **47**(1):34–40.

Jain, A.K. and Uludag, U. (2003b). Hiding biometric data. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **25**(11):1494–1498.

Jain, A.K., Bolle, R. and Pankanti, S. (Eds.) (1999). *Biometrics: Personal Identification in Networked Society*. Kluwer Academic Publishers.

Jain, A.K., Flynn, P. and Ross, A.A. (2008). *Handbook of Biometrics*. Springer-Verlag, New York, Inc., Secaucus, NJ, USA.

Jain, A.K., Hong, L. and Kulkarni, Y. (1998). F2ID: A Personal Identification System Using Faces and Fingerprints. in *Proc. of 14th International Conference on Pattern Recognition,* pp. 1373–1375.

Jain, A.K., Hong, L. and Kulkarni, Y. (1999). A Multimodal Biometric System Using Fingerprint, Face, and Speech. in *Proc. of 2nd International Conference on Audio- and-Video-Based Biometric Person Authentication*, pp. 182–187.

Jain, A.K., Nandakumar, K. and Nagar, A. (2008a). Biometric Template Security, *EURASIP Journal on Advances in Signal Processing* **8**(2):1–17.

Jain, A.K., Nandakumar, K., Lu, X. and Park, U. (2004a). Integrating Faces, Fingerprints and Soft Biometric Traits for User Recognition. in *Proc. of ECCV, International Workshop on Biometric Authentication (BioAW), LNCS 3087*, pp. 259-269, Prague, Czech Republic.

Jain, A.K., Nandakumar, K., Ross, A. (2005). Score normalization in multimodal biometric systems, *Pattern Recognition* **38**(12):2270–2280.

Jain, A.K., Pankanti, S., Prabhakar, S., Hong, L. and Ross, A. (2004b). Biometrics: A Grand Challenge. in *Proc. of International Conference on Pattern Recognition* (ICPR2040) 2, pp. 935-942, Cambridge, UK.

Jain, A.K., Ross, A. and Pankanti, S. (2006). Biometrics: A tool for information security, *IEEE Transactions on Information Forensics and Security* **1**(2):125–143.

Jain, A.K., Uludag, U. and Hsu, R.L. (2002b). Hiding a face in a fingerprint image. in *Proc. of International Conference on Pattern Recognition*, pp. 756–759.

Jolliffe, I.T. (2002). *Principal Component Analysis*. Spinger-Verlag, NY, 2nd Ed.

Juels, A. and Sudan, M. (2002). A Fuzzy Vault Scheme. in *Proc. of IEEE International Symposium on Information Theory*, 408, Lausanne, Switzerland.

Juels, A. and Wattenberg, M. (1999). A Fuzzy Commitment Scheme. in *Proc. of 6th ACM Conference on Computer and Communications Security*, pp. 28-36, Singapore.

Kale, A., RoyChowdhury, A.K. and Chellappa, R. (2004). Fusion of Gait and Face for Human Identification. in *Proc. of IEEE International Conference on Acoustics, Speech, and Signal Processing* (ICASSP) 5, pp. 901-904, Montreal, Canada.

Karanwal, S., Kumar, D. and Maurya, R. (2010). Fusion of Fingerprint and Face by Using DWT and SIFT. *International Journal of Computer Applications* **2**(5):33-36.

Kaur, M., Girhar, A. and Kaur, M. (2010). Multimodal Biometric System using speech and signature modalities. *International Journal of Computer Application* **5**(12):13-16.

Kazi M.M., Rode, Y.S., Dabhade, S.B., Al-Dawla, N.N.H., Mane, A.V., Manza, R.R. and Kale K.V. (2012). Multimodal Biometrics System Using Face and Signature: A Score Level Fusion Approach. *Advances in Computational Research* **4**(1):99-103.

Keller, J.M., Gray, M.R. and Givens, J.A. (1985). A fuzzy k-nearest neighbor algorithm. *IEEE Transactions on Systems, Man, and Cybernetics* **15**(4):580-584.

Kevin, W.B., Hollingsworth, K. and Patrick, J.F. (2008). Image Understanding for Iris Biometrics: A Survey. *Computer Vision and Image Understanding* **110**(2):281-307.

Kinnunen, T., Hautamaki, V. and Franti. P. (2004). Fusion of Spectral Feature Sets for Accurate Speaker Identification. in *Proc. of 9th Conference on Speech and Computer*, pp. 361-365, Saint-Petersburg, Russia.

Kittler, J., Hatef, M., Duin, R.P.W. and Mates, J.(1998). On combining classifiers. *IEEE Trans. on Pattern Analysis and Machine Intelligence* **20**(3):226–239.

Kong A., Cheung K.H., Zhang D., Kamel M. and You J. (2006). An analysis of BioHashing and its variants. *Pattern Recognition* **39**(7):1359–1368.

Kong, W. and Zhang, D. (2001). Accurate Iris Segmentation Based on Novel Reflection and Eyelash Detection Model. in *Proc. of ISIMVSP2001*, pp. 263–266.

Kothari, C.R. (2004). Research Methodology : Methods and Techniques, New Age International (P) Ltd.,

Kryszczuk, K., Richiardi, J., Prodanov, P. and Drygajlo, A. (2007). Reliability-Based Decision Fusion in Multimodal Biometric Verification Systems. *EURASIP Journal on Advances in Signal Processing Volume*, Article ID 86572.

Kumar, A. and Zhang, D. (2005). Personal Authentication using Multiple Palmprint Representation. *Pattern Recognition* **38**(10):1695-1704.

Kumar, A., Wong, D.C.M., Shen, H.C. and Jain, A.K. (2003). Personal Verification Using Palmprint and Hand Geometry Biometric. in *Proc. of 4th International Conference on Audio- and Video-based Biometric Person Authentication* (AVBPA), pp. 668-678, Guildford, UK.

Kuncheva, L.I. (2004). *Combining Pattern Classifiers - Methods and Algorithms*. 2nd Ed., Wiley.

Kuncheva, L.I. (2004). *Combining pattern classifiers: Methods and algorithms*. Wiley-Interscience publication, New Jersey, USA.

Leng, L. and Zhang, J. (2013). PalmHash Code vs. PalmPhasor Code. *Neurocomputing*. **108**:1–12.

Li, H., Wang, M., Pang, L. and Zhang, W. (2009). Key binding based on biometric shielding functions. in *Proc. of International Conference on Information Assurance and Security*, pp. 19–22. IEEE, New York.

Li, M., Tieniu, T., Yunhong, W. and Dexin, Z. (2003). Personal Identification based on Iris Texture Analysis. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **25**(12):1519–1533.

Li, P., Yang, X., Cao, K., Tao, X., Wang, R. and Tian, J. (2010). An alignment-free fingerprint cryptosystem based on fuzzy vault scheme. *Journal of Network and Computer Applications* **33**:207–220.

Li, S.Z. and Jain, A.K. (ed.) (2005). *Handbook of Face Recognition*, Springer-Verlag.

Li, Y., Gong, S. and Liddell, H. (2003a). Constructing Facial Identity Surfaces for Recognition. *International Journal of Computer Vision* **53**(1):71-92.

Liang, Q. and Mendel, J.M. (2000). Interval type-2 fuzzy logic systems: Theory and design. *IEEE Transactions on Fuzzy Systems* **8**(5):535–550.

Lim, S., Lee, K., Byeon, O., and Kim, T. (2001). Efficient iris recognition through improvement of feature vector and classifier, *ETRI J*. **23**(2):61–70.

Liu, Y., Yuan, S., Zhu, X., and Cui, Q. (2003). A practical iris acquisition system and a fast edges locating algorithm in iris recognition. in *Proc. of IEEE Instrumentation and Measurement Technology Conference*, pp. 166–168.

Lu, X. and Jain, A.K. (2005). Integrating Range and Texture Information for 3D Face Recognition. in *Proc. of IEEE Computer Society Workshop on Application of Computer Vision* (WACV2005), pp. 156-163, Breckenridge, USA.

Lu, X., Wang, Y., and Jain, A.K. (2003). Combining Classifiers for Face Recognition. in *Proc. of IEEE International Conference on Multimedia and Expo* (ICME), pp. 13-16, Baltimore, USA.

Ma, L., Tan, T., Wang, Y., and Zhang, D. (2004). Efficient Iris Recognition by Characterizing Key Local Variations. *IEEE Trans. Image Processing* **13**(6):739-750.

Ma, L., Wang, Y. and Tan, T. (2002). Iris recognition using circular symmetric filters. in *Proc. of the 25th International Conference on Pattern Recognition* (ICPR02) 2, pp. 414–417, Quebec.

Ma, Y., Cukic, B. and Singh, H. (2005). A Classification Approach to Multi-biometric Score Fusion. in *Proc. of 5th International Conference on Audio- and Video-based Biometric Person Authentication* (AVBPA'05), pp. 484-493, Rye Brook, USA.

Mahesh, P.K., and Swamy, M.N.S. (2011). A Comparative Evaluation for Fusion Strategies for Multimodal Biometric System using Palmprint and Speech Signal. *Journal of current Computer Science and Technology* **1**(4), pp. 107-114.

Maio, D., Maltoni, D., Cappelli, R., Wayman, J.L. and Jain, A. K. (2004). FVC2004: Third Fingerprint Verification Competition. in *Proc. of International Conference on Biometric Authentication* (ICBA), pp. 1–7, Hong Kong.

Maltoni, D., Maio, D., Jain, A. K. and Prabhakar, S. (2009). *Handbook of Fingerprint Recognition*. 2nd ed., Springer-Verlag.

Mansield, T., Kelly, G., Chandler, D. and Kane, J. (2001). Biometic product testing. Final Report, *National Physical Lab*., U.K.

Marcialis, G.L. and Roli, F. (2003). Experimental Results on Fusion of Multiple Fingerprint Matchers. in *Proc. of 4th Int. Conf. on Audio- and Video-Based Biometric Person Authentication*, pp. 814-820.

Marcialis, G.L. and Roli, F. (2004). Fingerprint Verification by Fusion of Optical and Capacitive Sensors. *Pattern Recognition Letters* **25**(11):1315-1322.

Marcialis, G.L. and Roli, F. (2005). Fusion of multiple fingerprint matchers by single-layer perceptron with class-separation loss function. *Pattern Recognition Letters* **26**(12):1830-1839.

Martin, A.F., Doddington, G.R., Kamm, T., Ordowski, M. and Przybocki, M.A. (1997). The DET curve in assessment of detection task performance. in *EUROSPEECH-1997.*

Martin, K., Lu, K., Bui, F.M., Plataniotis, K.N. and Hatzinakos, K. (2009). A Biometric Encryption System for the Self-Exclusion Scenario of Face Recognition. *IEEE Systems Journal* **3**(4):440-450.

Masek, L. and Peter Kovesi, P. (2003). *MATLAB Source Code for a Biometric Identification System Based on Iris Patterns*. The School of Computer Science and Software Engineering, The University of Western Australia [URL] http://staffhome.ecm.uwa.edu.au/~00011811/studentprojects/libor/sourcecode.html

Matlab (2012). Wavelet Toolbox, [URL] http://www.mathworks.com/help/releases/R2011a/ pdf_doc/allpdf.html#wavelet.

Meetei, T.C. and Begum, S.A. (2013). Performance Evaluation of Feature Selection Methods for ANN Based Iris Recognition, in *Proc. of ICETACS* 2013, pp. 208-213. doi:978-1-4673-5250-5/13©2013 IEEE.

Meetei, T.C. and Begum, S.A. (2014). A Comparative Study of Feature Extraction and Classification Methods for Iris Recognition. *International Journal of Computer Applications* **89**(7): 13-20.

Meetei, T.C. and Begum, S.A. A Cancelable Iris Biometric based on BioHashing, Under review for potential journal publication.

Meetei, T.C. and Begum, S.A. Interval Type-2 Fuzzy Integral Based Iris Recognition. Under review for potential journal publication.

Merloti, P.E. (2004). Experiments on Human Iris Recognition Using Error Backpropagation Artificial Neural Network. Dissertation, San Diego State University. [URL] http://merlotti.s465.sureserver.com/EngHome/Computing/iris_rec_nn.pdf.

Mira, J. and Mayer, J. (2003). Image feature extraction for application of biometric identification of iris - a morphological approach. in *Proc. of the 16th Brazilian Symposium on Computer Graphics and Image Processing* (SIBGRAPI 2003), pp. 391–398, Brazil.

Monro, D.M., Rakshit, S. and Zhang, D. (2007). DCT-Based Iris Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **29**(4):586-595.

Müller, K.R., Mika, S., Rätsch, G., Tsuda, K. and Schölkopf, B. (2001). An Introduction to Kernel-Based Learning Algorithms. *IEEE Transactions on Neural Networks* **12**(2):181-201.

MYCT database fingerprint and signature modalities. [URL] http://turing.ii.uam.es/bbdd_EN.html.

Nandakumar, K. (2008). *Multibiometric Systems: Fusion Strategies and Template Security*, Ph.D. Thesis, Department of Computer Science and Engineering, Michigan State University.

Nandakumar, K., Chen, Y., Dass, S.C. and Jain, A.K. (2008). Likelihood Ratio-Based Biometric Score Fusion. *Transaction on Pattern analysis and Machine Intelligence* **30**(2):342-347.

Nandakumar, K., Jain, A.K. and Pankanti, S. (2007a). Fingerprint-based Fuzzy Vault: Implementation and Performance. *IEEE Transactions on Information Forensics and Security* **2**(4):744-757.

Nandakumar, K., Jain, A.K. and Ross, A. (2009). Fusion in Multibiometric Identification Systems: What about the Missing Data?. in M. Tistarelli and M.S. Nixon (Eds.): ICB 2009, LNCS 5558, pp. 743–752, Springer-Verlag Berlin Heidelberg.

Nandakumar, K., Nagar, A. and Jain, A.K. (2007). Hardening Fingerprint Fuzzy Vault Using Password. in *Proc. of 2nd International Conference on Biometrics*, pp. 927-937, Seoul, South Korea.

Nie, M. and Tan, W.W. (2008). Towards an Efficient Type-Reduction Method for Interval Type-2 Fuzzy Logic Systems. in *Proc. of FUZZ-IEEE* 2008, pp. 1425–1432, Hong Kong.

NIST, (2002). Summary of NIST Standards for Biometric Accuracy, Tamper Resistance, and Interoperability. Report to the United States Congress. *National Institute of Standards and Technology*, [URL] ftp://sequoyah.nist.gov/pub/nist_internal_reports/ NISTAPP_Nov02.pdf.

NIST, (2004). Biometric Scores Set. *National Institute of Standards and Technology*, [URL] http://www.itl.nist.gov/iad/894.03/biometricscores .

Nixon, M.S., Carter, J.N., Cunado, D., Huang, P.S. and Stevenage, S.V. (1999). Automatic Gait Recognition. in Jain A.K., Bolle R. and Pankanti S., (Eds.) *Biometrics: Personal Identification in Networked Society*, pp. 231-249. Kluwer Academic Publishers, London, UK.

Ortega-Garcia, J., Fierrez-Aguilar, J., Simon, D., Gonzalez, J., Faundez-Zanuy, M., Espinosa, V., Satue, A., Hernaez, I., Igarza, J.J., Vivaracho, C., Escudero, D. and Moro, Q.I. (2003). Biometric on the Internet MCYT Baseline Corpus: a Bimodal Biometric Database. in *Proc. of IEEE Visual Image Signal Processing* 150(6), pp. 395-401.

Oviatt, S. (2003). Advances in Robust Multimodal Interface Design. *IEEE Computer Graphics and Applications* **23**(5):62-68.

Pillai, J.K., Patel, V.M., Chellappa, R. and Ratha, N.K. (2010). Sectored random projections for cancelable iris biometrics. in *Proc. IEEE International Conference Acoustics, Speech, Signal Processing*, pp. 1838–1841, Taipei.

Pillai, J.K., Patel, V.M., Chellappa, R. and Ratha, N.K. (2011). Secure and robust iris recognition using random projections and sparse representations. *IEEE Trans. Pattern Anal. Mach. Intell*. **30**(9), pp. 1877–1893.

Prabhakar, S. and Jain, A.K. (2002). Decision-level fusion in fingerprint verification. *Pattern Recognition* **35**(4):861–874.

Raghavendra, R., Rao, A. and Hemantha, K.G. (2010). Multimodal biometric score fusion using Gaussian mixture model and Monte Carlo method. *Journal of Computer Science and Technology* **25**(4):771–782.

Rashad, M.Z., Shams. M.Y., Nomir, O., El-Awady, R.M. (2011). Iris Recognition Based on LBP And Combined LVQ Classifier. *Int. J. Computer Science & Information Technology* (IJCSIT) **3**(5):68-78.

Ratha, N.K., Connell, J.H. and Bolle, R.M. (2000). Secure data hiding in wavelet compressed fingerprint images. in *Proc. of ACM Multimedia*, pp. 127–130.

Ratha, N.K., Connell, J.H. and Bolle, R.M. (2001a). An Analysis of Minutiae Matching Strength. in *Proc. of 3rd International Conference on Audio- and Video-Based Biometric Person Authentication* (AVBPA), pp. 223-228, Halmstad, Sweden.

Ratha, N.K., Connell, J.H. and Bolle, R.M. (2001b). Enhancing security and privacy in biometrics-based authentication systems. *IBM Systems Journal* **40**(3):614–634.

Ratha, N.K., Connell, J.H. and Chikkerur, S. (2007). Generating cancelable fingerprint templates. *IEEE Transactions on Pattern Analysis and Machine Intelligent* **29**(4):561-572.

Rathgeb, C., Breitinger, F., Busch, C. and Baier, H. (2013). On the Application of Bloom Filters to Iris Biometrics, in *Proc. of IET Biometrics*, doi:10.1049/iet-bmt.2013.0049@IEEE

Rathgeb, C., Uhl, A., Wild, P. (2013). Iris Biometrics: From Segmentation to Template Security, *Advances in Information Security* 59, Springer Science + Business Media, LLC

Razzak, M.I., Yusof, R. and Khalid, M. (2010). Multimodal face and finger veins biometric authentication. *Scientific Research and Essays* **5**(17):2529-2534.

Ricardo, N.R., Ling, L.L., Govindaraju, V. (2009). Robustness of multimodal biometric fusion methods against spoof attacks. *Journal of Visual Language and Computing*, doi:10.1016/j.jvlc.2009.01.010

Ross, A. and Govindarajan, R. (2005). Feature Level Fusion Using Hand and Face Biometrics. in *Proc. of SPIE Conference on Biometric Technology for Human Identification II* 5779, pp. 196-204, Orlando, USA.

Ross, A. and Jain, A.K. (2003). Information Fusion in Biometrics. *Pattern Recognition Letters* **24**(13):2115-2125.

Ross, A., Jain, A.K. and Qian, J. (2001). Information Fusion in Biometrics. in *Proc. of 3rd Int. Conf. on Audio- and Video-Based Biometric Person Authentication*.

Ross, A., Jain, A.K., and Reisman, J. (2003). A Hybrid Fingerprint Matcher. *Pattern Recognition* **36**(7):1661-1673.

Ross, A., Nandakumar, K. and Jain, A.K. (2006). *Handbook of Multibiometrics*. Springer.

Rowe, R.K., Nixon, K.A., Parthasaradhi, S. and Uludag, U. (2007). Robust Fingerprint Acquisition: A Comparative Performance Study. in *Proc. of SPIE Conf. on Biometric Technology for Human Identification IV*.

Ryu, C., Kim H. and Jain A.K. (2006). Template Adaptation based Fingerprint Verification. in *Proc. of 18th International Conference on Pattern Recognition* 4, pp. 582–585.

Sanchez-Reillo, R., Fernandez-Saavedra, B., Liu-Jimenez, J., and Sanchez-Avila, C. (2007). Vascular biometric systems and their security evaluation. in *Proc. of IEEE International Carnanhan Conference on Security Technology*, pp. 44-51.

Sanderson, C. and Paliwal, K.K. (2002). Information Fusion and Person Verification Using Speech and Face Information, *Technical Report IDIAP-RR 02-33*, IDIAP.

Sha, L., Zhao, F. and Tang, X. (2007). A Two-Stage Fusion Scheme using Multiple Fingerprint Impressions. in *Proc. of International Conference on Image Processing* 2, pp. 385–388.

Sharat, C., Alexander, N.C., Venu G. (2007). Fingerprint enhancement using STFT analysis. *Pattern Recognition*, **40**:198 – 211.

ShashiKumar, D.R., Raja, K.B., Chhootaray, R.K., and Pattnaik, S. (2011). PCA based Iris Recognition using DWT. *International Journal of Computer Technology and Application* **2**(4):884-893.

Simon-Zorita, D., Ortega-Garcia, J., Sanchez-Asenjo, M. and Gonzalez-Rodriguez, J. (2003). Facing Position Variability in Minutiae-Based Fingerprint Verification Through Multiple References and Score Normalization Techniques. in *Proc. of 4th International Conference on Audio- and Video-Based Biometric Person Authentication*, pp. 214–223,

Snelick, R., Uludag, U., Mink, A., Indovina, M. and Jain, A. K. (2005). Large Scale Evaluation of Multimodal Biometric Authentication Using State-of-the-Art Systems. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **27**(3): 450-455

Socolinsky, D.A., Selinger, A. and Neuheisel, J.D. (2003). Face Recognition with Visible and Thermal Infrared Imagery. *Computer Vision and Image Understanding* 91(1-2):72-114.

Soutar, C., Roberge, D., Stoianov, A., Gilroy, R. and Kumar, B.V.K.V. (1998a). Biometric Encryption using Image Processing. in *Proc. of SPIE* 3314, pp. 178–188.

Soutar, C., Roberge, D., Stoianov, A., Gilroy, R. and Kumar, B.V.K.V. (1998b). Biometric Encryption – Enrollment and Verification Procedures, in *Proc. of SPIE* 3386, pp. 24–35.

Sun, Z., Wang, Y., Tan, T. and Cui, J. (2005). Improving Iris Recognition Accuracy via Cascaded Classifiers. *IEEE Transactions on Systems, Man and Cybernetics, Part C* **35**(3), 435-441.

Teoh, A.B.J., Goh, A. and Ngo, D.C.L. (2006). Random Multispace Quantization as an Analytic Mechanism for BioHashing of Biometric and Random Identity Inputs. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, **28**(12):1892-1901.

Teoh, A.B.J., Kuan, Y.W. and Lee, S. (2008). Cancellable biometrics and annotations on biohash. *Pattern Recognition* **41**(6):2034–2044.

Teoh, A.B.J., Ngo, D.C.L. and Goh, A. (2004). Biohashing: two factor authentication featuring fingerprint data and tokenised random number. *Pattern Reorganization* **37**(11):2245–2255.

Teoh, A.B.J., Samad, S.A. and Hussain, A. (2002). Decision Fusion Comparison for a Biometric Verification System Using Face and Speech. *Malaysian Journal of Computer Science* **15**(2):17-27.

Toh, K.A., Jiang, X. and Yau, W.Y. (2004). Exploiting Global and Local Decisions for Multimodal Biometrics Verification. *IEEE Transactions on Signal Processing, (Supplement on Secure Media)* **52**(10):3059-3072.

Toh, K.A., Xiong, W., Yau, W.Y. and Jiang, X. (2003). Combining Fingerprint and Hand-Geometry Verification Decisions. in *Proc. of 4th International Conference on Audio- and Video-based Biometric Person Authentication* (AVBPA), pp. 688-696, Guildford, UK.

Toh, KA. (2004). A Reduced Multivariate Polynomial Model for Multimodal Biometrics and Classifiers Fusion. *IEEE Transactions on Circuits and Systems for Video Technology* **14**(2):224-233.

Tuyls, P., Akkermans, A.H.M., Kevenaar, T.A.M., Schrijen, G.-J., Bazen, A.M., and Veldhuis, R.N.J. (2005). Practical Biometric Authentication with Template Protection. in *Proc. of 5th International Conference on Audio-and Video-based Biometric Person Authentication*, pp. 436-446, Rye Town, USA.

Uhl, A. and Wild, P. (2009). Single-sensor multi-instance fingerprint and eigenfinger recognition using (weighted) score combination methods. *International Journal on Biometrics* **1**(4):442–462.

Uludag, U., Pankanti, S., Prabhakar, S. and Jain, A.K. (2004). Biometric cryptosystems: Issues and challenges, in *Proc. of the IEEE* **92**(6), pp. 948–960.

UTHSCSA (2001). Positively aging R & M.O.R.E. curricular programs, anatomy of the human eye, 2001. UTHSCSA Teacher Enrichment Initiatives. [URL] http://teachhealthk-12.uthscsa.edu/curriculum/vision-hearing/vision01a-anatomy.asp.

Vajaria, H., Islam, T., Mohanty, P., Sarkar, S. Sankar, R. and Kasturi, R. (2007). Evaluation and analysis of a face and voice outdoor multi-biometric system. *Pattern Recognition Letters* **28**:1572–1580.

Vatsa, M., Singh, R., Mitra, P. and Noore, A. (2004). Comparing robustness of watermarking algorithms on biometrics data. in *Proc. of the Workshop on Biometric Challenges from Theory to Practice – ICPR Workshop*, pp. 5–8.

Vielhauer, C. (2006). *Biometric User Authentication for IT Security*, vol. 18. Springer, New York.

Wagdarikar, A.M.U., Patil, B.G., Subbaraman, S. (2010). Performance Evaluation of IRIS Recognition Algorithms using Neural Network Classifier. IEEE, 978-1-4244-5539-3/10.

Wang, Y. and Plataniotis, K. (2007). Face based biometric authentication with changeable and privacy preservable templates. in *Proc. of the IEEE Biometrics Symposium* 2007, pp. 11-13.

Wang, Y., Tan, T. and Jain, A.K. (2003). Combining Face and Iris Biometrics for Identity Verification. in *Proc. of 4th International Conference on Audio- and Video-Based Biometric Person Authentication* (AVBPA), pp. 805–813, Guildford, UK.

Wang, Z., Wang, E., Wang, S. and Ding, Q. (2011). Multimodal Biometric System Using Face-Iris Fusion Feature. *Journal of Computers* **6**(5):931-938.

Wildes, R. (1997). Iris Recognition: an Emerging Biometric Technology. in *Proc. of IEEE* **85**(9), pp. 1348-1363.

Woods, K., Bowyer, K. and Kegelmeyer, W.P. (1997). Combination of Multiple Classifiers Using Local Accuracy Estimates. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **19**(4):405-410.

Wu, X., Qi, N., Wang, K. and Zhang, D. (2008). An iris cryptosystem for information security. in *Proc. of 2008 International Conference on Intelligent Information Hiding and Multimedia Signal Processing*, pp. 1533–1536. IEEE, New York.

Xu, L., Krzyzak, A. and Suen, C.Y. (1992). Methods for Combining Multiple Classifiers and their Applications to Handwriting Recognition. *IEEE Transactions on Systems, Man, and Cybernetics* **22**(3):418-435.

Yan, Y. and Zhang, Y. (2008). Multimodal Biometrics Fusion Using Correlation Filter Bank. IEEE -978-1-4244-2175-6/08.

Yang, J., Yang, J-Y., Zhang, D. and Lu, J-F. (2003). Feature Fusion: Parallel Strategy vs. Serial Strategy. *Pattern Recognition* **38**(6):1369-1381.

Yu, L., Zhangb, D., Wanga, K. and Yanga, W. (2005). Coarse iris classification using box-counting to estimate fractal dimensions. *Pattern Recognition* **38**:1791 – 1798.

Zhang, D., Kong, A.W.K., You, J., and Wong, M. (2003). Online Palmprint Identification. *IEEE Transactions on Pattern Analysis and Machine Intelligence* **25**(9):1041-1050.

Zhaofeng, H., Tieniu T., and Zhenan S. (2006). Iris Localization via Pulling and Pushing, in *Proc. of International Conference on Pattern Recognition*, pp. 366 – 369.

Zhou, S., Krueger, V., and Chellappa, R. (2003). Probabilistic Recognition of Human Faces from Video. *Computer Vision and Image Understanding* **91**(l-2):214-245.

Zunkel, R. (1999). Hand Geometry Based Authentication. in Jain A.K., Bolle R. and Pankanti S. (Eds.). *Biometrics: Personal Identification in Networked Society*, 87-102, Kluwer Academic Publishers, London, UK.

Zuo, J., Ratha, N.K. and Connel, J.H. (2008). Cancelable iris biometric. in *Proc. of the 19th International Conference on Pattern Recognition* (ICPR'08), pp. 1-4.