

{tag}

{/tag}

International Journal of Computer Applications

© 2012 by IJCA Journal

Volume 45 - Number 5

Year of Publication: 2012

Authors:

Vaibhav V. Dixit

Pradeep M Patil

A. V. Deshpande

10.5120/6774-9065

{bibtex}pxc3879065.bib{/bibtex}

Abstract

Security is a major concern in many facets of life today. During the last decade, Forensic Science in India has also taken a big leap. Recent introduction of the said biometrics facilities in Forensic Laboratories is now ready to take the forensics to the doorsteps of common man. A decade ago, a new branch of biometric technology, palmprint authentication, was proposed whereby lines and points are extracted from palms for personal identification. In this paper, we consider the palmprint as a piece of texture imprint and apply texture-based feature extraction techniques to palmprint authentication. In order to make the proposed algorithm rotation and translation invariant, the ROI of the imprint has been cropped from the captured palmprint image, prior to feature extraction. A 2-D Gabor filter is used to extract the important features for obtaining the textural information. Features of the query palmprint image have been compared in terms of the Euclidian distance with the templates in the database. The experimental results illustrate the effectiveness of the proposed method for criminal identification based on the palmprints found at the crime scene. The results and conclusions match the standard of forensic laboratories. an efficient algorithm using Haarclassifiers like features for real time face detection is devised then motion analysis techniques are used to locate the user's eye by

detecting eye blinks. The eye is tracked in real time using correlation with an open eye template. If the user's depth changes significantly or rapid head movement occurs, the system is automatically reinitialized. The principle of the proposed system is based on the real time eye blink detection for warning the driver of drowsiness or inattention to prevent traffic accidents. The facial images of driver are taken by a camera with frame rate of 30fps. An algorithm is proposed to determine the level of fatigue by measuring the eye blink duration and tracking of the eyes, and warn the driver accordingly. The system is also able to detect when the eyes cannot be found. These experiments on four drivers/subjects yielded an overall blink detection accuracy of 87.01% and overall drowsiness detection accuracy of 81.14%.

References

- S. Pankanti, R. M. Bolle, A. Jain, Biometrics: the future of identification, IEEE Comput. 33 (2) (2000) 46–49.
- A. Jain, R. Bolle, S. Pankanti (Eds.), Biometrics: Personal Identification in Networked Society, Kluwer Academic, Dordrecht, 1999.
- R. Sanchez, C. Sanchez-Avila, A. Gonzalez-Marcos, Biometric identification through geometry measurements, IEEE Trans. Pattern Anal. Mach. Intell. 22 (10) (2000) 1168–1171.
- A. K. Jain, A. Ross, D. Prabhakar, An introduction to biometric recognition, IEEE Trans. on Circuits and Systems for Video Technology 14 (1) (2004) 4–20.
- D. Zhang, W. Shu, "Two novel characteristics in palmprint verification: datum point invariance and line feature matching," Pattern Recognition 32 (4) (1999) 691–702.
- W. Shu, D. Zhang, "Automated personal identification by palmprint," Optical Engineering 37 (8) (1998) 2659–2662.
- J. You, W. Li, D. Zhang, "Hierarchical palmprint identification via multiple feature extraction," Pattern Recognition 35 (4) (2002) 847–859.
- N. Duta, A. K. Jain, K. V. Mardia, "Matching of palmprint," Pattern Recognition Letter 23 (4) (2001) 477–485.
- C. C. Han, H. L. Cheng, K. C. Fan, C. L. Lin, "Personal authentication using palmprint features," Pattern Recognition (Special issue: Biometrics) 36 (2) (2003) 371–381.
- Wai Kin Kong, David Zhang, Wenxin Li, "Palmprint feature extraction using 2-D Gabor filters," Pattern Recognition 36 (2003) 2339 – 2347.
- D. Zhang, W. Kong, J. You, M. Wong, "Online palmprint identification," IEEE Trans. Pattern Anal. Mach. Intell. 25 (9) (2003) 1041–1050.
- C. C. Han, H. L. Chen, C. L. Lin, K. C. Fan, "Personal authentication using palm-print features," Pattern Recognition 36 (2) (2003) 371–381.
- A. Kumar, D. C. M. Wong I, H. C. Shen I, A. Jain, "Personal verification using palmprint and hand geometry biometric," Lecture Notes in Computer Science, Vol. 2688, Springer, Berlin, 2003, pp. 668–678.
- Wangli Yang, Shuhua Wang, LongmeiJie, Guoqiang Shao, "A New Palmprint Identification Technique Based on a Two –stage Neural Network Classifier," in proceedings of Fourth International Conference on Natural Computation, 2008, pp 18-23.
- W. Li, D. Zhang, and Z. Xu, "Palmprint Identification by Fourier Transform," International Journal on Pattern Recognition and Artificial Intelligence, vol. 16, no. 4, pp. 417–

432, 2002.

- Leqing Zhu, Sanyuan Zhang, RuiXing, Yin Zhang, "Palmprint Recognition Based on PFI and Fuzzy Logic," Fifth International Conference on Fuzzy Systems and Knowledge Discovery.
- Wangli Yang, Shuhua Wang, LongmeiJie, Guoqiang Shao, "A New Palmprint Identification Technique Based on a Two stage Neural Network Classifier," Fourth International Conference on Natural Computation.
- Manisha P. Dale, Madhuri A. Joshi, Neena Gilda, "Texture Based Palmprint Identification Using DCT Features," Seventh International Conference on Advances in Pattern Recognition, 2009.
- Tee Connie, Andrew TeohBeng Jin, Michael GohKahOng, David Ngo Chek Ling, "An automated palmprint recognition system," Image and Vision Computing 23 (2005) 501–515.
- Xiao-Yuan Jing and David Zhang, "A Face and Palmprint Recognition Approach Based on Discriminant DCT Feature Extraction," IEEE transactions on systems, man, and cybernetics—part b: cybernetics, vol. 34, no. 6, December 2004, pp 2405-2415.
- W. Shu, G. Rong, Z. Bian, "Automatic palmprint verification," Int. J. Image Graphics 1 (1) (2001) 135–151.
- Xiangqian Wu, David Zhang, Kuanquan Wang, Bo Huang, "Palmprint classification using principal lines," Pattern Recognition 37 (2004) 1987 – 1998.
- J. G. Daugman, "Two-dimensional spectral an alysis of cortical receptive field profiles," Vision Research 20, 1980, pp 847–856.
- J. G. Daugman, "Uncertainty relation for resolution in space, spatial frequency, and orientation optimized by two dimensional visual cortical filters," Journalof Optical Society America, 2 (7), 1985, pp 1160–1169.

Index Terms

Computer Science

Pattern Recognition

Keywords

Biometrics Palmprint Gabor Transform Feature Extraction Euclidean Distance Personal Identification

