Bayesian face recognition

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Abstract

We propose a new technique for direct visual matching of images for the purposes of face recognition and image retrieval, using a probabilistic measure of similarity, based primarily on a Bayesian (MAP) analysis of image differences. The performance advantage of this probabilistic matching technique over standard Euclidean nearest-neighbor eigenface matching was demonstrated using results from DARPA's 1996 FERET face recognition competition, in which this Bayesian matching algorithm was found to be the top performer. In addition, we derive a simple method of replacing costly computation of nonlinear (on-line) Bayesian similarity measures by inexpensive linear (off-line) subspace projections and simple Euclidean norms, thus resulting in a significant computational speed-up for implementation with very large databases.

Keywords
About the Author

BABACK MOGHADDAM is a Research Scientist at Mitsubishi Electric Research Laboratory in Cambridge MA, USA. He received the B.S. (Magna Cum Laude) and M.S. (Honors) degrees in Electrical & Computer Engineering from George Mason University in 1989 and 1992, respectively, and his Ph.D. degree from the Department of Electrical Engineering and Computer Science at the Massachusetts Institute of Technology in 1997. During his doctoral studies he was a Research Assistant in the Vision & Modeling group at the MIT Media Laboratory, where he developed an automatic face recognition system that was the top competitor in ARPA's FERET face recognition competition. His research interests include computer vision, image processing, computational learning theory and statistical pattern recognition. He is a member of Eta Kappa Nu, IEEE and ACM.

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TONY JEBARA received his BEng in honours electrical engineering from McGill University, Canada in 1996. He also worked at the McGill Center for Intelligent Machines from 1994-1996 on computer vision and 3D face recognition research. In 1996, he joined the MIT Media Laboratory to work at the Vision and Modeling “Perceptual Computing Group. In 1998, he obtained his M.Sc. degree in Media Arts and Sciences for research in real-time 3D tracking and visual interactive behavior modeling. He is currently pursuing a Ph.D. degree at the MIT Media Laboratory.
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