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Besma Roui Abidi

Research Assistant Professor

The University of Tennessee, Knoxville

317 Ferris Hall

Knoxville, TN 37996-2100

Phone: 865.974.9918

besma@utk.edu

Topic: Multispectral fusion for indoor and outdoor face authentication

Abstract: Face analysis via multispectral imaging is a relatively unexplored territory in face recognition research. The Multispectral, Multimodal and Multi-illuminant IRIS-M3 database was acquired, indoors and outdoors, to promote research in this direction. In the database, each data record has images spanning all bands in the visible spectrum and one thermal image, acquired under different illumination conditions. The spectral power distributions of the lighting sources and daylight conditions are also encoded in the database.

Multispectral fused images show improved face recognition performance compared to the visible monochromatic images. Galleries and probes were selected from the indoor and outdoor sections of the database to study the effects of data and decision fusion in the presence of lighting changes. Our experiments were validated by comparing cumulative match characteristics of monochromatic probes against multispectral probes obtained via multispectral fusion by averaging, principal component analysis, wavelet analysis, illumination adjustment and decision level fusion. In this effort, we demonstrate that spectral bands, either individually or fused by different techniques, provide better face recognition results with up to 78% improvement on conventional visible images.

Biography: Dr. Besma R. Abidi is a Research Assistant Professor with the Department of Electrical and Computer Engineering at the University of Tennessee, Knoxville, which she joined in 1998. She occupied a post-Doctorate position with the Oak Ridge Institute of Science and Energy and was a research scientist at the Oak Ridge National Laboratory from 1998 until 2001. From 1985 to 1988 she was Assistant Professor at the National Engineering School of Tunis, Tunisia.

Dr. Abidi obtained two M.S. in 1985 and 1986 in image processing and Remote Sensing with honors from the National Engineering School of Tunis. She received her Ph. D. from The University of Tennessee in 1995. Her general areas of research are in surveillance, video tracking, sensor positioning and geometry, scene modeling, nano vision, and biometrics. She is a senior member of IEEE, a member of SPIE, Tau Beta Pi, Eta Kappa Nu, Phi Kappa Phi, and The Order of the Engineer.