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Topic: Toward a Human-like Similarity Measure for Face Recognition

Abstract: We propose an approach for capturing a human similarity measure (within an artificial neural network, SVM, or other classifiers) for face recognition. That is, the following important and long desired goal appears achievable: "The similarity measure used in a face recognition system should be designed so that humans' ability to perform face recognition and recall are imitated as closely as possible by the machine". For each person of interest, a dedicated classifier is developed. Within the classifier we effectively capture a human classification functionality. This is done by automatically generating and labeling two arbitrarily large sets of morphed images (typically tens of thousands). One set is composed of images with reduced resemblance to the imaged person, yet recognizable by humans as that person (positive exemplars); the second set consists of look-alikes, i.e. "others" who look most like the imaged person (negative exemplars). Humans, unlike most face recognition systems, do not rank images as a precursor to recognition. Like humans, our system does not rank images, as it is capable of rejecting images of previously unseen faces (or faces which are not of interest) by simply examining their images, and recognizing faces for which it is trained to identify. We demonstrate this capability in our presented experiments, where a large set of impostor images that were not provided during training are consistently rejected by the system.

Biography: Behrooz Kamgar-Parsi received the Ph.D. degree in physics from the Catholic University of America, Washington, DC, in 1978. He is currently a senior research scientist the Center for Applied Research in Artificial Intelligence, Naval Research Laboratory, Washington, DC, where he has performed research in pattern recognition/computer vision and artificial neural networks since 1989. From 1985 to 1988 he held the position of research scientist at the University of Maryland, Computer Vision Laboratory, College Park, and in 1988-1989 he was an assistant professor of computer science at George Mason University, in Fairfax, Virginia. He did research on numerical analysis while at the Center for Information Technology of the National Institute of Health, in Bethesda, Maryland from 1981 to 1984. In addition, he achieved a significant breakthrough in medicine in 1981, while doing research on sleep disorders at the National Institutes of Health. His current research interests include pattern recognition, face recognition, vision system for low-flying small air vehicles. He has authored many scientific publications and holds two US patents in image processing and pattern recognition. He is a member of the IEEE and SPIE and has served as program committee member and session chair for many conferences and events. He is also an Associate Editor of the Journal of Pattern Recognition Letters.