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**ABSTRACT**

We present a neural network-based upright frontal face recognition system. A rationally connected neural network examines small windows of an image, and decides whether each window contains a face. The system arbitrates between multiple networks to improve performance over a single network. We present a straightforward procedure for aligning positive face examples for training. To collect negative examples, we use a bootstrap algorithm, which adds false detections into the training set as training progresses. This eliminates the difficult task of manually selecting non face training examples, which must be chosen to span the entire space of non face images. Simple heuristics, such as using the fact that faces rarely overlap in images, can further improve the accuracy. Comparisons with several other state-of-the-art face recognition systems are presented, showing that our system has comparable performance in terms of recognition and false-positive rates.