



Face recognition in low resolution thermal images

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Abstract:

This paper proposes an accurate, rotation invariant, and fast approach for detection of facial features from thermal images. The proposed approach combines both appearance and geometric information to detect the facial features. A texture based detector is performed using Haar features and AdaBoost algorithm. Then the relation between these facial features is modeled using a complex Gaussian distribution, which is invariant to rotation. Experiments show that our proposed approach outperforms existing algorithms for facial features detection in thermal images. The proposed approach's performance is illustrated in a face recognition framework, which is based on extracting a local signature around facial features. Also, the paper presents a comparative study for different signature techniques with different facial image resolutions. The results of this comparative study suggest the minimum facial image resolution in thermal images, which can be used in face recognition. The study also gives a guideline for choosing a good signature, which leads to the best recognition rate.

Keywords:

Thermal imaging; MAP; Probabilistic model; Features detection

Published In:

Journal of Computer Vision and Image Understanding , 117 , 1689-1694