A passive stereo system for 3D human face reconstruction and recognition at a distance

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Abstract:

In this paper, we propose a front-end framework for 3D human face reconstruction and recognition at a distance. A stereo acquisition system is built and deployed to capture stereo pairs of subjects at different distances. Three main issues are addressed to achieve accurate face reconstruction, which leads to good recognition; Different illumination conditions between the stereo pair due to larger baseline and further distances, where a fast similarity measure based on normalized cross correlation is shown to tackle such problem. Due to the non-convexity nature of a human face, concave regions introduce occluded regions where cubic Splines are used to estimate the disparity. Disparity discontinuities are introduced due to the sparse nature of stereo reconstruction, where surface fitting is performed at prominent facial points. We present our database of 99 subjects at different ranges where reconstruction and recognition results are presented.

Keywords:

Face recognition, 3d reconstruction

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