A METHOD FOR CREATING A 3D FACE IMAGE FROM A 2D FACE IMAGE

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A method for creating a 3D face model by using a single 2D face image is presented in this paper. A 3D face image can be modeled using a set of 3D face model images of other persons in the database. The 3D face image is actually parameterized in terms of depth and texture. This property can be used to facilitate the creation of a 3D face image from a 2D one. For this purpose, a 3D face database is first developed. When a 2D face image is presented to the system, a 3D face image, which starts with an average 3D face image derived from the 3D face database, is projected onto the 2D plane, after rotation, translation, scaling and interpolation. The projected image is compared with the input 2D face image, and an optimization algorithm is applied to minimize an error index by selecting the 3D depth and texture parameters. Once the algorithm converges, the resulting 3D depth and texture parameters can be employed to construct a 3D face model of the subject photographed in the 2D image. One advantage of this method is that only the depth and texture parameters are required to be stored in the database, which can be used for either the recreation of a 3D image of the subject or for the 3D face recognition purpose. Results from an experimental study presented in the paper also show the effectiveness of the proposed approach.