

Thesis	MODIFICATION OF 3-D FACIAL SURFACE MODEL USING B-SPLINE SURFACE WAVELET AND THIN-PLATE SPLINE TECHNIQUE
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Year	2006
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ABSTRACT

Face-analysis from images has received an increasing attention from pattern recognition, image processing and analysis, computer vision and computer graphics communities. This interest is motivated by a broad range of potential applications including, for example, personal identification and access control, low-bandwidth communication for teleconference, human-computer interaction and automated surveillance. Tasks such as the creation of 3D facial models, 3D-pose estimation, 3D-motion estimation and tracking are active research topics. In this thesis we describe a novel approach for modeling a 3D-face structure to fit a 2D image view of a human face taken at a priori unknown poses by appropriately morphing a generic wire-frame 3D-face model. A Thin-plate spline morphing in 3D is used to morph a generic face into the specific face structure. This allows the creation of a database of 3D faces that is used in identifying a person in the database from one (or more) arbitrary image view. We also exploit multi-resolution surface representation of B-spline wavelet technique to represent the 3D generic wire-frame face at a lower resolution and then morphs to fit the 2D image with Thin-plate spline before reconstructing to a high resolution level by B-spline wavelet.