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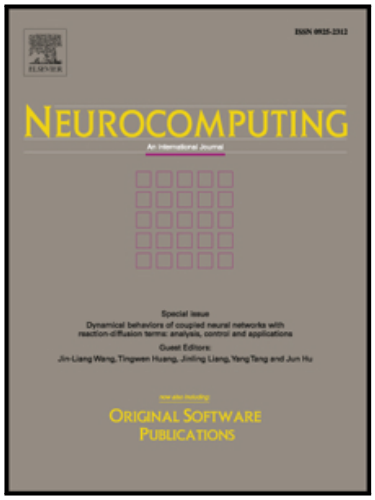

Facial Feature Point Detection: A Comprehensive Survey

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Facial Feature Point Detection: A Comprehensive Survey

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Abstract

This paper presents a comprehensive survey of facial feature point detection with the assistance of abundant manually labeled images. Facial feature point detection favors many applications such as face recognition, animation, tracking, hallucination, expression analysis and 3D face modeling. Existing methods are categorized into two primary categories according to whether there is the need of a parametric shape model: parametric shape model-based methods and nonparametric shape model-based methods. Parametric shape model-based methods are further divided into two secondary classes according to their appearance models: local part model-based methods (*e.g.* constrained local model) and holistic model-based methods (e.g. active appearance model). Nonparametric shape model-based methods are divided into several groups according to their model construction process: exemplar-based methods, graphical model-based methods, cascaded regression-based methods, and deep learning based methods. Though significant progress has been made, facial feature point detection is still limited in its success by wild and real-world conditions: large variations across poses, expressions, illuminations, and occlusions. A comparative illustration and analysis of representative methods provides us a holistic understanding and deep insight into facial feature point detection, which also motivates us to further explore more promising future schemes.

Index Terms

Deep learning, face alignment, facial feature point detection, facial landmark localization.