A novel ASM-based two-stage facial landmark detection method

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Abstract

The active shape model (ASM) has been successfully applied to locate facial landmarks. However, in some exaggerated facial expressions, such as surprise, laugh and provoked eyebrows, it is prone to make mistaken detection. To overcome this difficulty, we propose a two-stage facial landmark detection algorithm. In the first stage, we focus on detecting the individual salient facial landmarks by applying a commonly-used Adaboosting-based algorithm, and then further apply a global ASM to refine the positions of these landmarks iteratively. All the salient facial landmarks are corner-type points, they are left/right eye inner and outer corners, left/right eyebrow inner and outer corners, and left/right mouth corners. From the 10 salient landmarks, a global active shape model of facial landmarks is constructed. In the second stage, both the individual detection results of corner-type facial landmarks and a new estimation of nose composition serve as the initial positions of the whole facial active shape model which can be further refined iteratively by a modified ASM algorithm. Experimental results demonstrate that the proposed method can achieve very good performance in locating facial landmarks and it consistently and considerably outperforms the traditional ASM method.

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