A Study of Fast Face Detection Algorithm

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ABSTRACT

Among all the techniques of biometric authentication, the methods of detection and recognition based on facial features have greatly developed for the recent years. Face recognition is a relatively direct, friendly, and non-intrusive method which can be easily accepted by most people as individual identification. As a preprocessing step for face recognition, face detection however plays a very important role on the recognition rate of subsequent face classification because it provides us with a large amount of useful information about identified faces. To be a successful face recognition system, both accuracy and speed of face detection are very critical for following face tracking and recognition. This research aims to propose a new algorithm to detect multiple faces under complex background in a still image. This algorithm includes some techniques such as lighting compensation, color segmentation, image binary, morphological dilation and erosion operation, and connected-component label. Color segmentation firstly extracts the skin color of face from a cluttered image, and then image binary technique further form it into a more complete region. Next, morphological erosion operation is used to eliminate some small spots in a testing image. Contrary to erosion, dilation enlarges and connects a small and disconnected face region marked. Subsequently, a connected-component label method is employed to label multiple faces in a testing image. Finally, area threshold and aspect ratio are used to validate a corrected face region. By conducting several experimental tests, results show that the proposed algorithm certainly works well to validate multiple face regions under complex background quickly and accurately.

Keywords : Face detection ; Lighting compensation ; Color segmentation ; Morphology ; Connected component

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