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Learning an Video Frame-based face detection system for security fields

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Abstract

It is known that face detection as a kind of artificial intelligence (AI) technology has become an indispensable tool in our daily life, which produces effects on every aspect of us. The demand for detection and recognition is higher accuracy and higher speed in different areas. So a new video frame-based face detection system is designed to help us making good safety precautions in recognition between normal face and abnormal face. Abnormal face means that face is partially occluded by some objects such as mask, sunglasses and so on. Since these abnormal faces are easily recognized as normal faces in previous detection systems, they are often ignored. And it brings us some potential dangers, especially in the area of residential face detection access, bank business login and other security areas. This system provides a complete set of process for detecting faces from video and distinguishing them, which achieves a good real-time performance in accuracy and speed. We adopt libfacedetection to detect faces from each frame. In addition, we introduce a dlib library which is a deep learning tool to help aligning face and extract the characteristic value. And a GMM clustering algorithm is provided to train and test images for the system. This system can help us to make a distinction between normal face and abnormal face, which is of great significance to the security field in the future.

Keywords: Video Frame-based face detection, libfacedetection, deep learning, Gaussian Mixture Model

1. Introduction

Face detection and recognition as one of the biometrics identification technology, using biological characteristic [22] of the organism itself to distinguish the individual. It belongs to the hot research field of computer technology. Comparing with other biometric methods, it has several merits including: non-contact, non-intrusive, infrastructure complete and expansion outstanding. It is not required to contact with human body which can directly identify the facial features from images, so as to achieve a wide range of multi-orientation information gathering. On the one hand, the acquisition of faces from images is not required to be coordinated by the participant and without staff intervention. On the other hand, face belongs to the biological feature that is exposed, so identifying them is more easily accepted by the public.

In some current methods, opencv is used to detect whether images contain faces

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