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Checking attendance system for coal mine based on face recognition

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Abstract

In this paper, the core algorithm is studied, which aiming at developing a robust and practical checking attendance system in the coal mine based on face recognition. In order to solve recognition rate reduction resulting from illumination, pose etc variations to some extent, the Kernel Fisher Discriminant analysis (KFD) method is studied, which the corrected model and the fractional power polynomial kernel function are employed to further improve robustness to the above variations. Through the Matlab simulation experiments on ORL face database, it is showed that the method is of higher recognition rate and more robustness to the above variations.

Key words: *Face recognition, Kernel Fisher criterion, Corrected model, Fractional power polynomial*

1. Introduction

The vertical and horizontal tunnels stretch so long in coal mine, under the ground, the operation staffs are often moving, and the communication is inconvenience. The number of the operation staffs change every time, it is very difficult to examine the time when they go down the mine. Once it happened to be fire, flood, gas and coal dust explosions and other accidents in coal mine, it is hard to know the exact data of staff in accident location in short time, and hard to develop some effective schemes for relieving disaster, it often delay the best time for rescue and cause irreparable losses. In this paper, an attendance management system based on face recognition is studied, it not only realizes the automatic attendance and management for mine workers, but also be able to dynamic display and real-time demand for leadership going down the mine; if the mine happens accidents, the system can attemper and command mine workers in time. In addition, the system can also combines with the mine attendance, labor wages, safety supervision, and other components, becoming a modern management system.

Face recognition technology (Kaufman and Breeding, 1976) is an important branch of Biometrics and it is also the study focus of Pattern Recognition and Computer Vision, which interest is mainly motivated by the broad range of potential applications for systems that are able to recognize the face they contain, such as surveillance, personal identification, access control, conference, and human computer interface. Fisher linear discriminating analysis (FDA) has been recognized as one of the most popular and classical ways, the FDA is used for statistical data analysis, it has some limitations and different types of samples can not be effectively separated. Consequently, Kernel Fisher discriminant analysis (KFD)

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