

Research on Face Recognition System using Wavelet Analysis

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Abstract

Recently, the importance and usability of facial recognition technology has gained more attention over time. Applications include access control, attendance management system, e-commerce, financial transactions, ATM, online banking user authentication system, electronic payment system and airport search. It is used in various fields such as systems, web user authentication systems, intelligent video surveillance devices, computer security and information security systems. Facial recognition technology is superior in terms of ease of use because it requires no special contact or action from the user and has the advantage of being able to perform a surveillance function by storing facial images. A representative method for face recognition is the Principal Components Analysis (PCA) algorithm. However, facial recognition technology uses a person's face as biometric information, so it is very complex and has many variables such as diversity of facial information and lighting conditions, so there is a problem of low recognition speed. In this paper, we use wavelet analysis to implement a face recognition system that is robust to the diversity of face information and illumination of the traditional principal component analysis method. To evaluate the performance of a face recognition system using wavelet transform and principal component analysis, a comparative analysis is performed using the traditional principal component analysis method and the Fisher linear discriminant analysis method. The recognition speed is improved by changing the image data for wavelet analysis to conditions that are robust to light and facial expressions. Experiment and simulation results show that wavelet transform and principal component analysis methods show a more stable improvement rate for face recognition than the traditional PCA method.

Keywords

Heart Rate, Personality, BIG5, Python and Scatter Plot

Biographies

Benny Choi is student in MY PAUL SCHOOL. He is interested in artificial intelligence, deep learning, cryptography, robots, healthcare, block chains, drones, autonomous vehicles, etc., and is conducting related research.

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Shin Dong Ho is Professor and Teacher in MY PAUL SCHOOL. He obtained his Ph.D. in semiconductor physics in 2000. He is interested in artificial intelligence, deep learning, cryptography, robots, block chains, drones, autonomous vehicles, mechanical engineering, the Internet of Things, metaverse, virtual reality, and space science, and is conducting related research.