Hindawi
Mathematical Problems in Engineering
Volume 2022, Article ID 2474047, 14 pages
https://doi.org/10.1155/2022/2474047

Research Article

Intelligent Clothing Design and Data Acquisition under the Scientific Graphics Programming Combined with Wearable Multisensor

Mengshu Ding,[1] **Qistina Donna Lee Abdullah**,[2] **and Salmiah bt Abdul Hamid**[2]

[1]*School of Fashion, Henan University of Engineering, Zhengzhou, Henan, China*
[2]*Faculty of Applied and Creative Arts, University Malaysia Sarawak, Kota Samarahan, Sarawak, Malaysia*

Correspondence should be addressed to Mengshu Ding; dingmengshu@haue.edu.cn

Received 6 January 2022; Revised 28 January 2022; Accepted 1 February 2022; Published 15 April 2022

Academic Editor: Naeem Jan

This research focuses on the improvement of intelligent Hanfu design system's performance. Henceforth, in the current study, an intelligent Hanfu design data acquisition system based on scientific graphics programming and wearable multisensor is designed for the field of human body size measurement and human model reconstruction. Initially, on the basis of wearable multisensor, a design of the recognition and analysis system of human posture is presented. The error of nine-axis inertial sensor in the process of collecting data, the data of accelerometer, gyroscope, and magnetometer are preprocessed, and the processing results are observed. Moreover, MATLAB programming is used for preprocessing of collected images. It is also used for grey normalization, filtering denoising, and image sharpening. The advantages and disadvantages of different methods are compared experimentally. Experiments show that MATLAB programming is more suitable for grey normalization than histogram equalization, and local brightness will appear in histogram equalization. After denoising the image with salt-and-pepper noise and Gaussian noise, the median filter and mean filter have defects. Wiener's adaptive filter leads to the increase of noise, and wavelet denoising has the best effect. The data acquisition system of intelligent Hanfu design established in this work provides a certain direction for the development of intelligent Hanfu design.

1. Introduction

In recent years, the number of Hanfu lovers has increased rapidly, and the Hanfu industry has attracted more and more attention. The development and progress of economy, science, and technology have promoted the development of e-commerce platform. People are more and more inclined to online shopping, and the proportion of Hanfu online shopping is also gradually increasing. Therefore, for the problem of low quality and ill-fitting of Hanfu in online shopping, intelligent Hanfu design can effectively design Hanfu according to the physical characteristics of consumers to make it more suitable for consumers. The most important thing in intelligent Hanfu design is the construction of human body data acquisition system, which can help Hanfu design collect human body data and improve the design.

Many researches have been made on human data acquisition at home and abroad. Chung et al. built a test platform, including eight wearable inertial measurement unit sensors and an Android mobile device for activity data acquisition. A long-term and short-term memory network framework was developed to support the training of deep learning models for human activity data obtained in the real world and controlled environment [1]. Dickinson et al. determined the effects of collar size and collar weight on the acceleration measured by the collar mounted accelerator. The purpose is to propose best practices for the size and weight of collars for deploying triaxial accelerometers [2]. Liberadzki et al. proposed a multispectral separation support method based on structured light to realize multidirectional and parallel acquisition. In this method, single-frame fringe projection is used for detailed geometric reconstruction. An