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Advanced Computer Vision Based Virtual Dressing Room

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***Abstract*— The cloth pattern simulation is a new approach to clothing simulation using low dimensional linear subspaces with temporally adaptive bases . Our method exploits full-space simulation training data in order to construct a pool of low-dimensional bases distributed across pose space. For this purpose we interpret the simulation data as offsets from a kinematic deformation model that captures the global shape of clothing due to body pose. As an essential part of cloths animation, the dressing process also as important impact to the overall system performance and applicability.**

Especially in the virtual network dressing room of clothes e-commerce system, it is still a problem how to dress various clothes more simply and efficiently. We also show how our simulation data can be post-processed with the collision- aware sub-division scheme to produce smooth and interference free data for rendering.

***Index Terms*—**

I. INTRODUCTION

Matching clothes is a challenging task for many blind people. In this paper, we present a system to solve this problem. This system can handle clothes with deficient colours and complex pattern, as well as clothing with multiple colours and complex patterns to aid both blind and colour-blind people. Furthermore, our method is robust to variations of illumination, clothing rotation and wrinkling.

To evaluate the proposed prototype, we collect two challenging databases, including clothes without any pattern, or with multiple colours and different patterns under different conditions of lighting and rotation. Results reported here demonstrate the robustness and effectiveness of the proposed clothing matching system. Our approach achieves 92.55% recognition accuracy.

II. METHODS

A. EXISTING SYSTEM

Texture analysis method mainly focuses on texture with large changes in viewpoint, orientation, and scaling, but with less intra-class pattern and intensity variations. People perceive an object to be the same despite even large changes in the spectral composition of light, reflected from the object.

Thus, object colours determined from a camera image may not always correspond perfectly to those reported by a human observer.
Shadows and Wrinkles may be confused as a part of a texture pattern or imagery of the clothing and thus cause errors. Thirdly, the images of clothes can be imaged from arbitrary viewing directions. Methods of matching patterns require the input pair of images must be pattern rotation-invariant.

The drawbacks are- Decreased security, more expensive and time taken for matching is more.

B. PROPOSED SYSTEM

There are two sections in this system (i.e) hardware and software. The hardware has a USB Camera and the RFID Scanner whereas, The software comprises of MATLAB Programming and the software for it. The three main components in our system are- color detection and matching, pattern detection and pattern matching. Color detection is where one can select suitable colors for their personality. Pattern detection is where the system recognizes their sizes and choses various patterns such as polka dots or stripes. Pattern matching is where the person can select the patterns of their choice based on the response from the previous step. Our algorithm can detect colors of various clothes. Clothes have pattern or homogenous colors. The color is first matched with an image pair and the patterns are also matched in the similar fashion.

C . IMPELEMENTATION

This system is based on the mass-spring model and runs on a desktop computer with a dual core AMD 2.91 GHz processor and 2GB of RAM all the three dimensional clothes and mannequin models are saved in 3D files. MATLAB 2016a Software is used here for the image processing implementation.

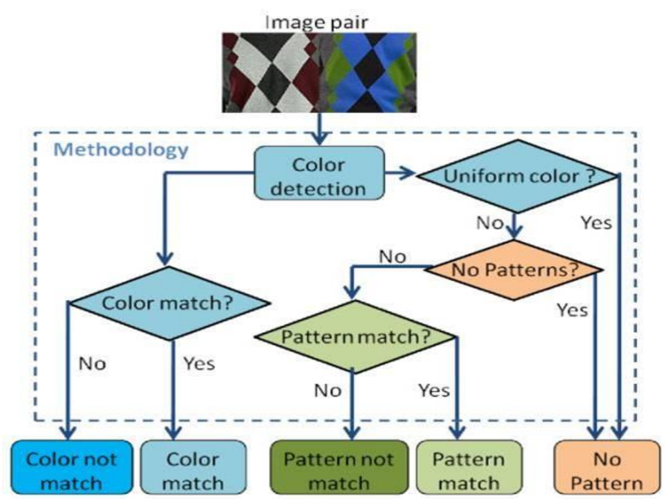

Figure 1.1 Flow Chart

D . THE SYSTEM ARCHITECTURE

Our strategies for optimizing the cloth simulation. Our simulator is based on two levels of deformation : it first deduces the gross cloth behaviour by working on a coarse mesh with a physics-based approach whereas the second generates wrinkles on a fine mesh with a geometric methods. The coarse mesh is generated by simplifying the original cloth mesh through segementation. The reason for this choice is to lower the computation time ; geometric methods are in general much faster than physically-based once.

When observing the behaviour of garment worn by a character, there are considerable correlations between the body motion and the movement of garment. These correlations are especially clear for some clothes like tight shirts and trousers. In our method we take advantage of these relationships to reduce the computation load on the mass-spring system and collision detection.

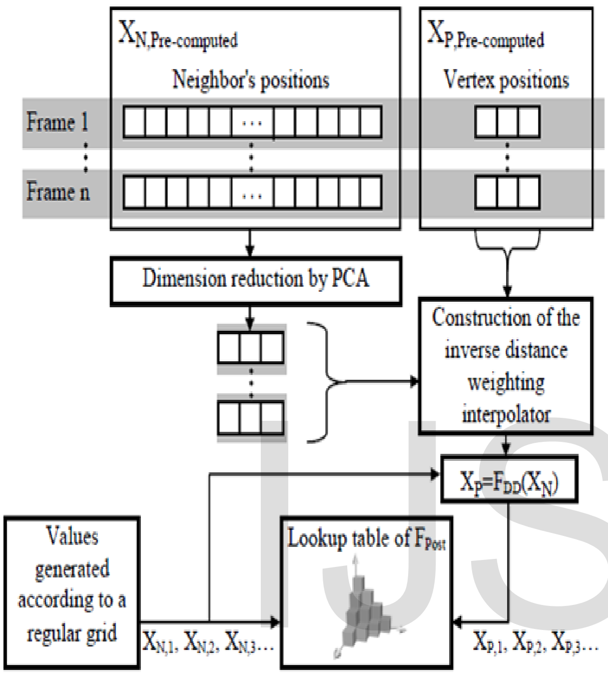

Figure 1.2 System Architecture

III. SOFTWARE REQUIREMENTS

MATLAB 2016a

MATLAB(matrix laboratory) is a multi-paradigm numerical computing environment and fourth-generation programming language. A proprietary programming language developed by MathWorks, MATLAB allows matrix manipulations, plotting of functions and data , implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages, including C,C++,C#, Java, Fortran and Python.

Although MATLAB is intended primarily for numerical computing, an optional toolbox uses the MuPAD symbolic engine, allowing access to symbolic computing abilities. An additional package, Simulink, adds graphical multi-domain simulation and model-based design for dynamic and embedded systems.

IV. FUTURE ENHANCEMENT

There are several avenues for future work on animated dressing. One possibility is to incorporate dexterous manipulation of the cloth with our current system. Such an augmented system would allow a hand to properly grip a sleeve, instead of " gluing " the hand to a portion of the cloth as we currently do. Another important aspect of dexterous manipulation that we have not explored is the use of hands in fastening the garments, as is needed to use buttons, Zippers and laces. As suggested in the Limitations section, we might want a system that can figure out a high level dressing strategy for a newly presented garment. Such a system would likely need to do some form of search across a variety form of dressing strategies.

V. APPLICATIONS

1. Finite-element based solid simulation.
2. Film, Gaming and online fashion applications.
3. Fashion technology clothing applications.
4. Textile shops.

VI. CONCLUSION

This paper presents the first report of a practical and efficient methods for handling real-time simulation almost automatically. We used our framework to produce visually pleasing motion of a wide range of clothes. Both the mass-spring system and collision detection have been rewritten to take advantage of the pre-simulated sequence of the clothes to be animated. Consequently, our cloth simulator is able to construct a model for real-time animation without user intervention and can deal with different types of clothes form tight to floating with low computation consumption. There are many interesting avenues for future work. First, the approach could be extended to simulating other physics-based models such as hair and fluid.

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