APPAREL FIT BASED ON VIEWING OF 3D VIRTUAL MODELS AND LIVE MODELS

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Introduction

Consumers purchasing apparel online are unable to “try on” products. A consumer must determine his or her apparel size by interpreting information from size charts provided by a company. When consumers order customized products and they are not satisfied, especially after a long wait for delivery of the product, the results are extra returns, lower sales, and the associated cost to the retailer ($Miller, Schuchard, Koch, & Moskaw, 2003).

To prevent these problems, mass customization researchers emphasize the importance of developing well-designed software tools that consumers can use in the product selection process (Dellal & Stennesen, 2005).

With the development of 3D body scanning and 3D virtual garment simulation technologies, online shopping is becoming more promising. However, this research has been done on the fidelity and accuracy of 3D virtual dressing software to prove that it can represent a real person in a garment so that the virtual try-on can be used reliably for apparel fit assessment.

Research Purpose

The purpose of the research was (1) to investigate the fidelity and accuracy of a 3D virtual garment simulation tool in assessing fit on a 3D virtual model by comparing the resulting fit on the 3D virtual model and on the participant real body through participant evaluation and (2) to evaluate the effectiveness of the tool for 3D online virtual clothing shopping for consumers.

Furthermore (2003) presented a conceptual framework to explain functional realism for computer graphics. Meaningful functional realism has two criteria: (1) accuracy and (2) fidelity. When the computer graphic image is accurate, it means that its physically measurable property of the image is correct. When the image has fidelity, the image is true to the reality that the image is representing. Furthermore’s framework for functional realism in computer graphics is adapted as a framework for this study.

Methodology

The methodology for this study was developed to replicate an online shopping experience. Thirty-seven participants were recruited from students and employees at the University of Minnesota. The age range of the participants was 18 to 35 years.

Two questionnaires and an interview were used to collect data for the study. Two types of fit evaluation questionnaires were used for fit evaluation of the virtual pants on the virtual model and one for fit evaluation on the body.

A 3D virtual garment simulation software package developed by a leading US company was selected. Six slope patterns were reviewed as dress pants patterns and they were graded down and up to different sizes using the software. The test pants were constructed based on the patterns. A 60% cotton and 40% polyester blend gabardine was selected for the fabric. The fabric on the virtual model was draped smoothly and did not accurately represent wrinkles that were found with the test pants on the body. Additionally, the visual information on the degree and the location of tightness and looseness was not as accurate.

Discussions and Conclusion

The results led to the conclusion that the overall accuracy of the virtual-simulation tool was moderately good but not to the extent that the pants could perform all the aspects of the meaningful task of the fit evaluation that were important. This indicates that the fidelity of the virtual-simulation tool was moderate as well.

Both the limitations and the positive aspects of the tool were identified in this research. These findings will help computer scientists in developing and improving the 3D virtual garment simulation technologies. Designers and merchandisers who use this type of technology in the apparel industry would be able to make full use of the benefits of the technology while taking its limitations into consideration. Ultimately, the improved technology implemented in online shopping websites will help clothing consumers to make satisfactory and reliable online purchase decisions.

Bibliography


APPAREL STUDIES

Virtual Garment Simulation Process

Virtual Pants Real Parts

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Bibliography