World Academy of Science, Engineering and Technology
International Journal of Materials and Textile Engineering
Vol:11, No:07, 2017

Drape Simulation by Commercial Software and Subjective Assessment of Virtual Drape

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Abstract : Simulation of fabrics is more difficult than any other simulation due to complex mechanics of fabrics. Most of the virtual garment simulation software use mass-spring model and incorporate fabric mechanics into simulation models. The accuracy and fidelity of these virtual garment simulation software is a question mark. Drape is a subjective phenomenon and evaluation of drape has been studied since 1950's. On the other hand, fabric and garment simulation is relatively new. Understanding drape perception of subjects when looking at fabric simulations is critical as virtual try-on becomes more of an issue by enhanced online apparel sales. Projected future of online apparel retailing is that users may view their avatars and try-on the garment on their avatars in the virtual environment. It is a well-known fact that users will not be eager to accept this innovative technology unless it is realistic enough. Therefore, it is essential to understand what users see when they are displaying fabrics in a virtual environment. Are they able to distinguish the differences between various fabrics in virtual environment? The purpose of this study is to investigate human perception when looking at a virtual fabric and determine the most visually noticeable drape parameter. To this end, five different fabrics are mechanically tested, and their drape simulations are generated by commercial garment simulation software (Optitex®). The simulation images are processed by an image analysis software to calculate drape parameters namely; drape coefficient, node severity, and peak angles. A questionnaire is developed to evaluate drape properties subjectively in a virtual environment. Drape simulation images are shown to 27 subjects and asked to rank the samples according to their questioned drape property. The answers are compared to the calculated drape parameters. The results show that subjects are quite sensitive to drape coefficient changes while they are not very sensitive to changes in node dimensions and node distributions.

Keywords : drape simulation, drape evaluation, fabric mechanics, virtual fabric
Conference Title : ICTF 2017 : International Conference on Textiles and Fashion
Conference Location : Paris, France
Conference Dates : July 20-21, 2017