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COMPARING THE APPEARANCE OF VIRTUAL AND REAL WOMAN'S DRESS

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Abstract: *In work described we compared the appearance of real and virtual woman's dress and investigated their similarities and differences. In order to perform the research, we created a woman's dress, for which the patterns and fabric texture were developed while the properties of the material were selected from the OptiTex programme database. In this particular fashionable garment we researched the appearance and shape differences of real and virtual woman's dress.*
Key words: *dress, virtual garments, garment appearance*

1. INTRODUCTION

The paper deals with the comparison of virtual and real clothing. It introduces computer based information systems, which support construction and production processes in the fashion industry and additional, very practical functions of new computer technologies in the textile industry, such as visualisation techniques and realistic appearance of virtual textiles and clothing. The paper presents the construction of a woman's dress with the use of the PDS OptiTex program and virtual appearance on a virtual parametrical model of a woman's body. The dress was also sawn and presented on a real person, after which we researched the appearance and shape differences of real and virtual woman's dress. The result of this research strategy is a comparison between the virtual presentation of the dress and the dress on a real person (Hrastnik, J., 2008).

Short development cycle in the clothing industry more and more requires the application of state-of-the-art 3D virtual prototyping methods specially developed for garments. 3D simulation of the garments offers the user to simulate all pre-production activities including stitching, fitting, visualization, texture and colour variations of textile materials (Stjepanovič, Z.; Abram Zver, M., 2006).

Several levels of design complexities have to be considered while defining shape, assembly rules and aesthetic details of real tailored garments. Some types of garments are particularly elaborated. They are manufactured from large number of 2D panels with complex-shaped borders connected with each other by means of various darts and single/multiple seams. The final volume strongly depends on a multi-layered structure obtained by overlapping different types of fabric materials such as cotton, linen, etc. (Rizzi, C. 2010).

Virtual garment simulation is result of large combination of techniques that have also dramatically evolved during the last decade. Besides the mechanical models used for existing mechanical engineering for simulating deformable structures, many new challenges arise from versatile nature of cloth. Therefore, the garment simulation is based on development of the efficient mechanical simulation models, which support the reproduction of the specific nonlinear mechanical properties of cloth. In addition, the garment cloth interacts strongly with the body that wears it, as well as with the other garments layers. This requires the development of the advanced methods efficiently detecting the geometrical contacts constraining the behaviour of the cloth and integrating them into the mechanical model (Volino, P., 2005; Magnenat-Thelmann, N., 2005; Rudolf, A., 2009)

2. EXPERIMENTAL AND METHODS

The woman's dress was developed, constructed and produced in order to investigate the appearance of a real and virtual garment article based on merely style, patterns and texture of the fabric. In order to apply virtual dress on a human body, we prepared a virtual parametric model of a female body using the OptiTex PDS software (***, 2009). Virtual parametric body models can be defined precisely using the main and advanced body measurements, Fig.1.

Furthermore, we can define the pose and appearance properties of the virtual parametric body model in order to establish required similarity between the real and virtual human body (Rudolf, A.; Jevšnik, S.; Stjepanović, Z.; Pilar, T. 2008).

For basic pattern construction and modelling of dress patterns we used measurements of a real body. For virtual simulation it is necessary to define seams where the virtual and real dress is sewn together (Fig. 2) and position of each pattern on the virtual body (Fig. 3).

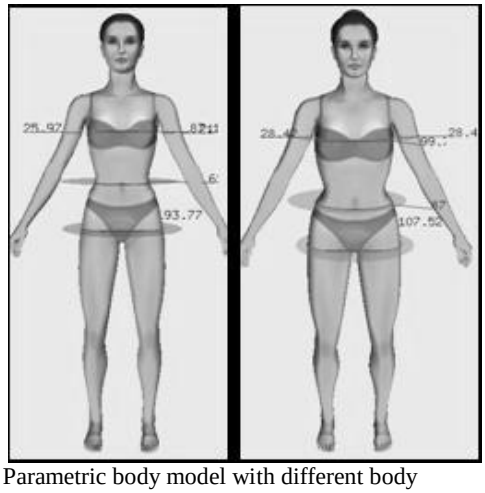

Fig. 1. Parametric body model with different body measurements

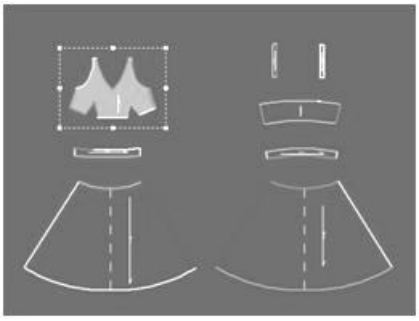

Fig. 2. Patterns with defined seams

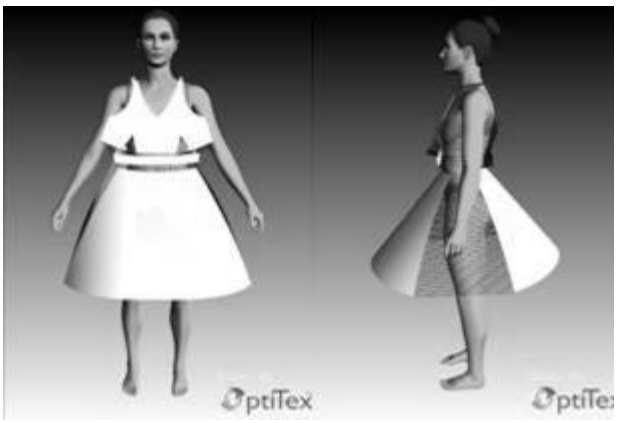

Fig. 3. Dress patterns in proper position for simulation - front and side views

After this the virtual simulation of a dress was made.

Within the research course we produced the designed dress using the white-dotted dark viscose fabric woven in 5-harness warp-faced satin weave with a surface mass of 138 gm^{-2}.

The parametric 3D virtual mannequin in OptiTex PDS 3D module was used for draping simulations. The 3D virtual mannequin has numerous precise adjustable body measures, resp. parameters. The adaptation of virtual body measurements in regards to real model is simply and quite exact; therefore, the virtual mannequin has the same body measurements as the real body for those measurements, which could be adjusted (Jevšnik, S.; Stjepanović, Z.; Celcar, D., 2009).

3. RESULTS AND DISCUSSION

The appearance of real woman's dress was investigated on a real person, which body measurements were used for setting-up the virtual parametric body model. In the research course, the comparison of the real and virtual garments was performed.

Real and virtual models wearing real and virtual woman's dresses are presented in Fig. 4 (back view).

Comparison of a real and virtual dress confirms the usability of virtual prototyping of garments. The similarities of both dresses and their draping behaviour are obvious. Therefore, we can conclude that virtual dress can be used for estimating the fit and appearance of a dress before it is actually produced. For even better results, one should use the fabric's real mechanical properties; furthermore its texture should be defined and presented more detailed (Rudolf, A.; Jevšnik, S.; Stjepanović, Z.; Pilar, T., 2009).

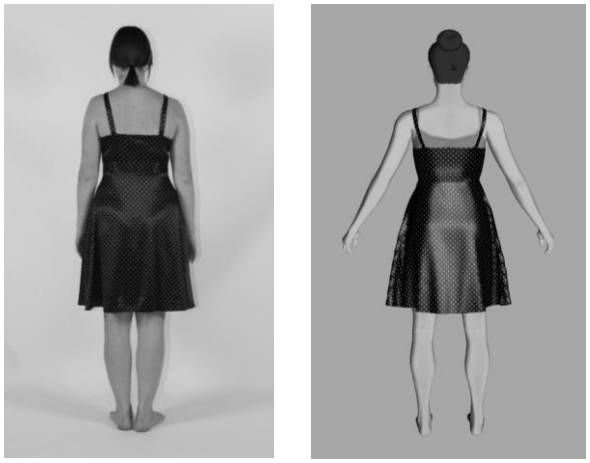
Fig. 4. Back views of a real and virtual dress on a real and virtual model


Fig. 5. Comparison of real (left) and virtual dress (right) - 3D side view, body models excluded

As a next step, we excluded both real and parametric bodies from the pictures in order to do further evaluation of similarities and differences between the real and virtual woman's dress, Fig. 5. For this comparison of appearance of both real and virtual dress we applied the side view, which gave really good results.

4. CONCLUSIONS

Based on the results of this study, we can conclude that virtual presentation has a great potential as a tool to evaluate the fit of a garment in a relatively simple and quick way. Furthermore, the progress achieved in the field of virtual presentations of garments presents a very important and promising link for e-tailoring chain of the future.

Real draping simulation will facilitate in future the use of more diverse types of materials for garment production. Therefore, by using 3D virtual prototyping we can reduce product development time and the cost involved in multiple iterations of sample garment production.

5. REFERENCES

Hrastnik, J. (2008) *Primerjava virtualnih in realnih oblačil*, *B.Sc. diploma work*, Fakulteta za strojništvo, Maribor

Igarashi, T.; Hughes, J.F.; (2002). Clothing Manipulation, *15th Annual Symposium on User Interface Software and Technology*, ACM UIST'02, 91-100

Jevšnik, S.; Stjepanović, Z.; Celcar, D.; (2009) Virtual clothes´ simulations. *Proceedings* V: JEVŠNIK,S.; MATIČIČ,N.; ŠTERMAN,S.; 1st International Conference I Love Inter/National Fashion, Ljubljana, , (4/2009), . 67-74.

Magnenat-Thelmann, N.; Volino, P. (2005). From early draping to haute couture models. *Visual Computer*, Vol.21 (8-10/2005), 506-519

Rudolf, A.; Jevšnik, S.; Stjepanović, Z.; Pilar, T. (2008) Comparisson between virtual and real shape of garments. *V: 8th AUTEX Conference*, (6/2008), 7

Rudolf, A.; Jevšnik, S.; Stjepanović, Z.; Pilar, T. (2009). Appearance of real vs. virtual fashion garments. *Tekstilna industrija*, Vol.57 (10-12/2009) 5-12.

Stjepanovič, Z.; Abram Zver, M. (2006). IBM 2006 – Novosti na področju 3D virtualnega prototipiranja izdelkov. *Tekstilec, Vol*, 46 (7-8), 191 – 197, ISSN 0351-3386

Volino, P.; Cordier, F.; Magnenat-Thelmann, N. (2005). From early virtual garment simulation to interactive fashion design. *Computer-Aided Design*, Vol. 37, 593-608

*** (2009) http://www.optitex.com/images/general/Brochure.pdf OptiTex, User manual, *Accessed on:*2009-06-06

***(2010) Rizzi, C et al., http://www.cadanda.com/ V1Nos1to4_24.pdf, *Accessed on:* 2010-05-16