

Tactile sensation (TSA) based and 3D optical analysis of woven fabrics

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Abstract: Haptics perception of the fabrics is very important for the customers. One of the criteria for selection of clothing and textiles for home textiles is based on the feeling they produce [1]. The feeling of the textile is related to the mechanical properties of the fabrics, to the yarn properties, but as well to the surface roughness and hairiness. More fibers on the surface can lead to softer appearance in some cases. From other side, the woven or knitted pattern structure influences very much the haptic perception of the fabrics [2], and the participants, their culture and the application area have as well influence on the perception [3].

This work presents analysis of two methods for surface analysis of woven samples (Figure 1) – optical and acoustical. The optical one is based on the 3D microscopic images using DSX1000 of company Olympus. The acoustical is based on the signal processing of the voice, produces after sliding of plate over the fabrics surface, measured by the TSA device of company EMTEC, Leipzig, Germany. Additionally, the results are compared with available results from human panel evaluation for these samples.

Both methods are applied for a set of woven samples for clothing and the obtained parameters are compared statistically, using principal component analysis (Fig. 2).

Keywords: surface, haptics, sensing, acoustics.

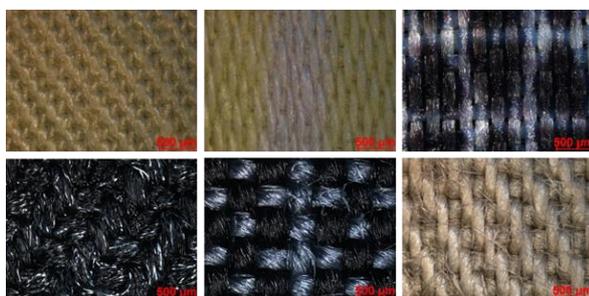


Figure 1 Microscopic images of the tested woven samples

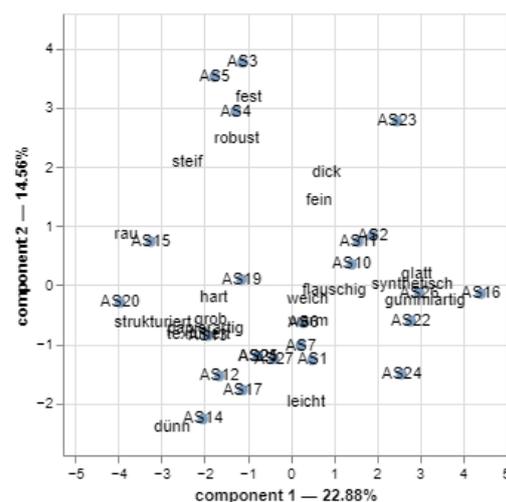


Figure 2 Principal component analysis (PCA) between Emtec and panel values.

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