of sample S5 (it is obvious from the pill number). It is visible that method A detected approximately three times as many pills as method B. The size of pills was bigger as well (but the pill size is not important for objective pilling evaluation). According to the comparison of the objective and subjective pilling grades, we can see that method A provided more accurate results.

Another possibility of judgment of the methods' accuracy could be a display of gradient images of a sample. In a gradient image, it should be obvious how many pills are there and where they are placed. ***Figures 7.a - 7.c*** display the gradient images in horizontal and vertical directions obtained from method A and grayscale image obtained from method B, where pills should be clearly visible as well. ***Figures 7.d & 7.e*** compare the binary images obtained from methods A and method B with respect to the pill distribution and number. From the comparison it is clearly obvious that method A proved to have more accurate results with respect to defect detection than method B.

Conclusion

The study was focused on the testing and comparison of two different principles of 3D surface reconstruction methods. The results were judged according to a comparison of the subjective and objective pilling grades, and to the detection of defects on the top of fabrics (pills). Firstly the gradient field method (method A) was tested. Method A is not time consuming - it needs just a few seconds for 3D surface reconstruction and data processing. Moreover the gradient filed method does not require expensive devices. A camera, a planar light source and special algorithm are sufficient for imaging and processing a 3D surface. In contrast to method A, method B was shown as time consuming and not such an accurate tool for pilling evaluation, where a more expensive device was necessary to use for 3D surface reconstruction. Due to the principle of 3D surface reconstruction by method A, pills were more reliable, accurate and faster detected than by method B. For these reasons, the gradient field method could be useful for the objective quality control of garments in the textile industry, especially for the pilling evaluation of various types of fabrics.

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