

Concept of Using an Indicator to Describe the Quality of Fit of Clothing to the Body Using a 3D Scanner and CAD System

Authors : Monika Balach, Iwona Frydrych, Agnieszka Cichocka

Abstract : The objective of this research is to develop an algorithm, taking into account material type and body type that will describe the fabric properties and quality of fit of a garment to the body. One of the objectives of this research is to develop a new algorithm to simulate cloth draping within CAD/CAM software. Existing virtual fitting does not accurately simulate fabric draping behaviour. Part of the research into virtual fitting will focus on the mechanical properties of fabrics. Material behaviour depends on many factors including fibre, yarn, manufacturing process, fabric weight, textile finish, etc. For this study, several different fabric types with very different mechanical properties will be selected and evaluated for all of the above fabric characteristics. These fabrics include woven thick cotton fabric which is stiff and non-bending, woven with elastic content, which is elastic and bends on the body. Within the virtual simulation, the following mechanical properties can be specified: shear, bending, weight, thickness, and friction. To help calculate these properties, the KES system (Kawabata) can be used. This system was originally developed to calculate the mechanical properties of fabric. In this research, the author will focus on three properties: bending, shear, and roughness. This study will consider current research using the KES system to understand and simulate fabric folding on the virtual body. Testing will help to determine which material properties have the largest impact on the fit of the garment. By developing an algorithm which factors in body type, material type, and clothing function, it will be possible to determine how a specific type of clothing made from a particular type of material will fit on a specific body shape and size. A fit indicator will display areas of stress on the garment such as shoulders, chest waist, hips. From this data, CAD/CAM software can be used to develop garments that fit with a very high degree of accuracy. This research, therefore, aims to provide an innovative solution for garment fitting which will aid in the manufacture of clothing. This research will help the clothing industry by cutting the cost of the clothing manufacturing process and also reduce the cost spent on fitting. The manufacturing process can be made more efficient by virtual fitting of the garment before the real clothing sample is made. Fitting software could be integrated into clothing retailer websites allowing customers to enter their biometric data and determine how the particular garment and material type would fit their body.

Keywords : 3D scanning, fabric mechanical properties, quality of fit, virtual fitting

Conference Title : ICCITE 2018 : International Conference on Clothing Industry and Textile Engineering

Conference Location : Vancouver, Canada

Conference Dates : August 09-10, 2018