Body Scanning to Develop an Avatar for Fitting Simulation
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Fitting issues are the top reasons customer return purchased items in the on-line shopping (Bain, 2016). On-line clothing retail Amazon announced to use body scanning due to major return cause of fitting issues (Yusuf, 2018). The definitive goal of body scanning and creating avatars are to conduct clothing fitting, reduce alteration, and ill fitting, increase using virtual fitting simulation before clothing manufactured. Additionally, the body scans can be generated model as personal avatar. The purpose of this project is two-fold. First, providing body scanning skills to undergraduate students and the creation of an avatar using an iPad with structure lens. Second, students will using virtual fitting simulation to evaluate fitting issues. A total of 29 female and male college students participated in body scanning in the academic year of 2018 and the development of an avatar using iPad with Structure lens.

Consumers express readiness to use avatars to try on clothing when the body size of the avatar appears to be close to their own size (Lin, Johnson, & Kang, 2018; Lin & Mammel, 2011). The use of body images and the creation of avatars will appeal to consumers who want to promote healthy activity, clothing selection, entertainment activities, and the growth of small businesses. E-commerce and small businesses can adopt virtual fitting rooms for virtual try-on to develop new business strategies, creating a border-free business world (Sul & Kang, 2010; Cho, Park, Boeing, & Hingston, 2010). Body scanning using iPad with Structure lens was adopted due the affordable price and easy to purchase and operation. Without a huge investment, students have a chance to learn the body scan process. The program, MeshLab, was used to view, edit, and measure personal avatar. Following the scanning process, subjects responded to a 20-item questionnaire about the process and resulting avatar. Overall, participants expressed satisfaction with their avatar and body shape and provided information about the use of avatars. If student doesn't want to be body scanning, a recruit subject can be used.

The participants were asked the question "How satisfied are you with the 3-D body image created by IPad with Structure lens captured data?" Approximately three quarters of participants expressed satisfaction with the avatar generated using iPad with structure lens. Results from the questionnaire included one male subject complained the current apparel sizing of using 3 variations of sleeve length and inseams did not fit all people. Also, the location of waist darts in some men's shirt resulted in a feminine look. One of subjects expressed the customized avatar could be used to make clothing for individual needs and one of a kind clothing. None of subjects previously experienced body scanning and creating their own avatar and expressed positive reactions to the new technology. Furthermore, less than 35% of the subjects have shopped for clothing on-line. About 15% of the subjects feel dissatisfied with parts of their body, such the waist, feet, or hands. All subjects self-reported their own body type in good shape. Very few subjects will make special order clothing from their avatar; however, they believe strongly they will use this technology to select clothing. And about half of them will order clothing from a retailer store that would use their avatar.

Overall, the majority of participants expressed satisfaction with their 3-D body images. Additionally, the avatar was a moderate to very accurate representation of their bodies. Subjects also indicated positive responses about body scanning technology and future applications. College students can readily adopt the new equipment and technology because iPad with Structure lens was very affordable, popular, and easy to operate. It is believed iPad with Structure lens will be used as a home based body scanning system to apply with any type of home shopping or on-line shopping. Also, this project provides valuable information about digital body imaging and personal avatars for various groups. The body-scan project can apply to any age group and enable businesses to be on the cutting edge by responding to consumers in this new virtual world.

Students were trained to use Optitex clothing fitting simulation. They were asked to select two outfits to simulate personal avatar. Students copied front, side, and back views into power point. Description of fitting simulation from shoulders, chest, waist and bottoms were expected to along with these clipped graphics. Students selected pattern form style bank or make their own pattern in the Optitex program.

Using fitting simulation technology and personal avatars, twenty-night subjects were used to conduct try-on exercise with standard size patterns. Fitting simulation helps students visualize how they will look when they wear the clothes. Students reported that for real try-ons, this fitting simulation resembled their bodies and was a very real experience. Some of them reported that the procedure was easy to operate and results were quick to view. An alter pattern skill also taught students to adjust pattern and fit personal avatar. Overall, students were happy to virtually evaluate clothing on personal avatar by using this new technology of fitting simulation. On the other hand, some students indicated that the body scan avatar was not clean, had a lot of lumps on the areas of thighs and arms. This occurred mostly because the arms and legs were too close to the other body and, therefore prevented the normal fall of the fabric on the body scan avatar. Unlike fitting on Optitex program avatar just one second with one click, fitting simulation on personal avatar can be time consumer due to body sharp various. Students have finished their computer 2D patter making before entered this class. In this class, students are trained to use 3D body scanning using iPad with Structure lens to general personal avatar. Also, students learned to use MeshLab to view and edit their personal avatar as well as measure body measurement. Finally, students used Optitex program to conduct body simulation and used power point to record the results of fitting. Overall, students will be trained to master these updated software to prepared modern 3D body scanning job market.

The use of digital personal avatars provides a new form of digital mirroring for consumers to take body measurements and try-on for clothing selection. Apparel manufacturer can reduce their risk to produce many items that consumers are not interested. A new business strategy and development can be adopted this technology to help small businesses and E-commerce may expand their business without worried geographic barrel.

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