Rhythmus 2019

Seoha Min, California State Polytechnic University, Pomona

Hye Young Kim, Winston Salem State University

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Contextual Review and Concept

Augmented Reality (hereinafter AR) technologies allow users to see the real world with virtual objects composited with the real world (Azuma, 1997). From the users' viewpoint, in other words, virtual and real objects coexist in the same space. This technology has recently received great attention in certain industries, and there are several publications regarding the utilization of AR technology in the field of consumer behavior and retailing (Bonetti, Warnaby, & Quinn, 2018). However, it is deemed that there are not sufficient discussions regarding the utilization of AR technology in the field of apparel design. In the future, we believe that AR-assisted fashion will be a popular means to express one's identity and messages to others. In this regard, we utilized AR technologies in apparel design to communicate the theme of the design. To demonstrate, we developed a prototype for an augmented reality app by utilizing AR tracking and registration techniques through Blender (3D animation software), Unity (game engine software), and Vuforia (AR software development kit). The purpose of the design was twofold: 1) Show by means of a concrete example that people can create AR for their garments and embed messages that they would like to communicate to others using the app; and 2) Provide insight into its potential for designers who would like to apply AR technology to their design.

Inspiration of the Design

The main inspiration for the garment came from the 1920s abstract film, which is a subgenre of experimental film. The films, produced by a group of German artists in the 1920s, mainly focused on non-narrative visual and sound experiences (Le Grice, 1979). In particular, we adopted Hans Richter's seminar work, *Rhythmus 21* (1921), in the design process. Hans Richter presented a series of elemental objects in the film focusing on the unique qualities of motion, rhythm, light, and composition to create viewers' multisensory experiences. As he focused on unique geometric qualities of the design elements, we created multisensory experiences with AR technologies and amplified viewers' experience with the dress. Please see how the multisensory experience of the dress is created through AR technologies from the following link: https://youtu.be/SdkZyCDEp44

Process, Technique, and Execution of the Dress

First, we utilized the draping technique to create a dress with navy velvet. Facing, side zipper, and snaps were attached to the dress. Then five buttons colored and embellished with beads were attached to the

neckline of the dress (please see Figure 1). The five buttons became visual targets for the AR technology to activate five different animations and the sound of chimes using Vuforia (AR software development kit), which is able to recognize and track visual targets by analyzing the contrast-based features of the target that are visible to the camera. Using Blender (3D animation software), five animations with 3D models were created based on the colors and shapes of the beads, which include basic geometric shapes, such as the cylinder and torus, and specular and transparent textures attached to the five buttons. Each animation is based on real objects, such as beads, and is given free movement and chime sounds to activate viewers' imagination. Then, Unity (game engine software) allowed us to create an interactive AR application by activating visual targets with Vuforia and importing the animations from Blender. And just like the German film artists, we focused on the unique qualities of motion, rhythm, and composition with the basic geometric shapes in the animations (please see the video from the following link: https://youtu.be/SdkZyCDEp44. With AR technology, these animations not only present pure abstraction but enhance multisensory experiences based on reality. This garment with AR technology can allow viewers to have visual, tactile, and auditory experience at the same time with various perspectives to perceive the garment.

Cohesion

We attempted to reinterpret the German film artists' work in the1920s, *Rhythmus 21*, with the current AR technologies. We created the five animations with various AR technologies, and they correspond well with the design elements of the five buttons.

Design Contribution and Innovation

AR technology has blossomed and is bringing about changes in various fields. Apparel designer should prepare to embrace these changes to their advantage. Here we proposed the potential direction of the future of design by demonstrating how AR can be applied to apparel design. The field of apparel design can benefit greatly from AR, and we hope this work brings about enhanced interest in our community regarding what designers believe is the most important future direction of the design.

Figure 1. Front view of the dress

Figure 2. Back view of the dress

Figure 3. Side view of the dress

Figure 4. Interesting detail of the dress

(Please see this video link: https://youtu.be/SdkZyCDEp44)

Reference

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