New Media for Exhibition of Historic Fashion: The Drexel Digital Museum Project

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Abstract:
New digitization technology has become a pervasive means of preserving and providing virtual embodiments of complex cultural objects which can be manipulated and examined by the viewer more meticulously than they can the physical object. Adam Lowe posits that "…facsimiles, and especially those relying on complex (digital) techniques, are the most fruitful way to explore the original and even to help re-define what originality actually is." And that "the digital is just one instance in the life of the original object" (Sattin and Lowe 2014). This presentation reports on the historic costume animations and high resolution interactive imaging of the Drexel Digital Museum (DDM) project. The DDM is experimenting with using these new modes of display not only in combination with museum objects in exhibition but freely accessible across the various platforms of the internet.

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Introduction

The Drexel Digital Museum (DDM) began in 1996 with the charge to organize the holdings of the Drexel Historic Costume Collection (DHCC) for student and faculty use; and to promote it to the fashion and museum communities. Since exhibition space, access and funds were limited, we decided the best way to accomplish this was to create a unique online presence for the Collection. Research of the user communities revealed the number one priority was high quality images, multiple views and details of construction and embellishment. Before any comprehensive imaging of the collection, it was important to set the highest quality image standard possible from the technology available at the time.

Early Archival Imaging

Fashion is the embodiment of silhouette, color and texture and is shaped by its relationship to society, history, economics, and technology. Advances in digital technology offer new modes of engagement with fashion objects for audiences, curators, designers, and content developers. A high quality digital object can create interesting tensions between reality and representation. The Drexel Digital Museum became one of the first online fashion archives to create the highest quality images and to show the fashion objects from multiple views, with details of construction and embellishment, via QuickTime Virtual Reality. Unlike conventional exhibition which does not allow for close examination as vitrines and low light are necessary to protect the historic object, if technology is used to enhance the experience, the museum visitor can view the cultural object from all sides and zoom in to details of construction and embellishments.

We observed the best practices standards of the Museum Online California, an early Museum Computer Network supported standard for digital imaging, and the guidelines of the Library of Congress (2000). ICOM standards for photography and dressing of historic costume were observed and we incorporated the ICOM *Vocabulary of Basic Terms for Cataloguing Costume* into our metadata descriptors.

Looking at an early example of our research, a Callot Soers evening dress, the quality of the image enables us to imagine its owner, Minnie Cassatt, granddaughter of AJ Drexel, founder of the University, turning heads as she attended an opening of the Philadelphia Orchestra, for which AJ was a founding board member (Rottenberg 2006) [Figure 1].

Figure 1: Evening Dress. Callot Soeurs. 1913. Image Collection: Drexel Digital Museum. Object Collection: Fox Historic Costume Collection. 54.1.7. Gift of Amanda (Minnie) Drexel Fell Cassatt.

Minnie, and she was a Minnie with a 19" waist, loved clothing, and her family donated steamer trunk after steamer trunk of her Paris and American couture to the DHCC. We can also imagine the Callot Soeur being inspired in their design and embellishment of this gown by attending exhibitions in the Louvre in the early 1900s which showcased the Egyptian, Asian and Pre-Columbian antiquities influencing designers at the beginnings of the Modernist movements at the time of the gown's creation.

QuickTime VR Alternatives

Apple stopped supporting QuickTime VR in 2015. Since then, the DDM has been researching alternative video formats to replace our QTVR files. Camtasia is an affordable software that can be used to create movies of multiple views and details of historic fashion from still images. Of course, the higher quality still image the better the movies. In this gown by Worth, worn by Caroline B. Grahame when she married Elliston Perot, the multiple views enable us to see the gored skirt, train and asymmetrically draped bodice of the silhouette. The quality of the imaging brings to life the texture of the cream satin brocade of the gown's body and the play of the

sparkle of the diamanté embellishment against the velvet shoulder straps and lace sleeves [Figure 2].

Figure 2: Wedding Dress. Worth. 1887. Image Collection: Drexel Digital Museum. Object Collection: Fox Historic Costume Collection. Gift of Mrs. Walker Farrel.

Our current research uses GigaPan technology to create high resolution 3D Object Virtual Reality movies (ObjectVRs) for display. Instead of imaging 18 views (sides) of the garment and embedding hotspots of details as we did with QTVR, we now image 20 views, using a camera on a robotic head (GigaPan) to capture 6-8 columns and 10-12 rows of image tiles per view. This results in 60 – 98 tiles per view, depending on the silhouette of the garment.
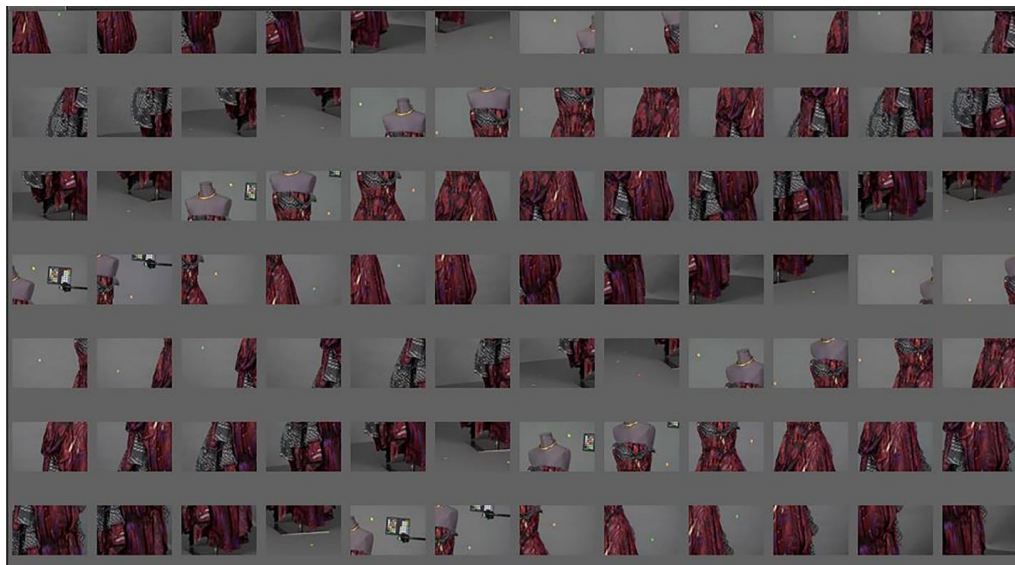

Figure 3: GigaPan tiles. Evening Gown. Christian Lacroix. 1996. Image Collection: Drexel Digital Museum. Object Collection: Mari Shaw.

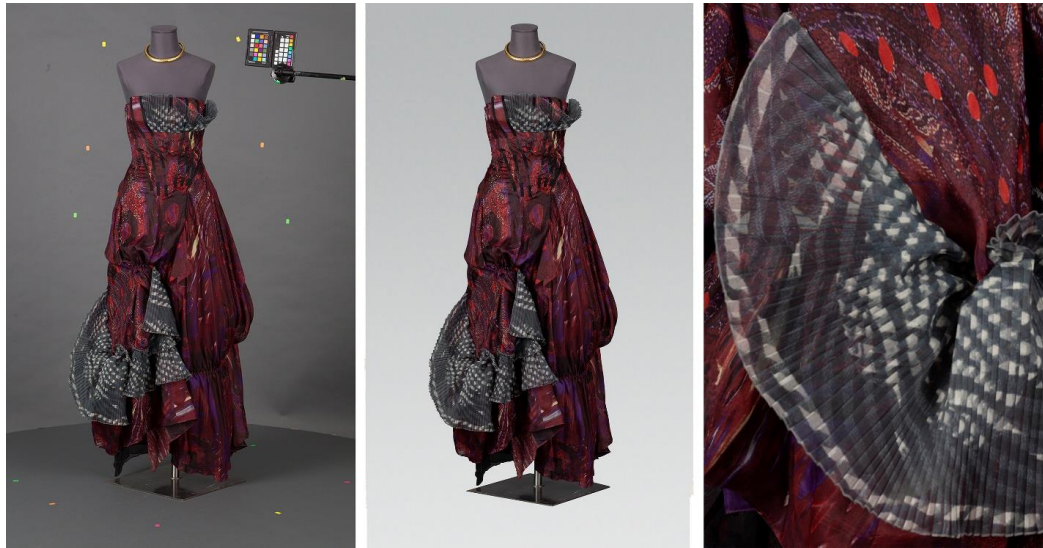These tiles are then stitched together for each of the 20 views using PTGUI software.

Figure 4: Left to right, RAW camera data, finished ObjectVR, detail. Evening Gown. Christian Lacroix. 1996. Image Collection: Drexel Digital Museum. Object Collection: Mari Shaw.

GardenGnome ObjectVR software is used to make the views into an HTML5 panorama. Because of the resulting high resolution of the virtual object, it can be displayed at up to three times life size, rotated in 360 degree panorama, and zoomed into rich detail without the need for embedded hot spots. While it is being imaged we keep the lighting on the gown even, not selecting and highlighting any particular design details . This gives the viewer the option to pan and zoom in on whatever details interest them. The background of the image is selected and dropped out. Particular attention is given to the definition of the edges of the image to remain visually authentic to the nature of the various fabrics used in the gown's construction. Dropping out the background will allow us to insert the ObjectVR into a variety of virtual environments for future exhibition.

Animating Fashion

The authenticity of the color, texture, silhouette deliver a rich visual experience of fashion. A full sensual experience would be to wear the gown and experience its structure, and the surface and motion of the fabric. Although the finite nature and conservation of historic fashion prevents us from dressing ourselves in the garments, emerging computer graphics provide a digital means to place the garment on an avatar and animate the fabric and silhouette. On the heels of research on 3D CGI animation and real-time textiles for historic fashion by Jane Harris in the *Empress's New Clothes,* and the work of Natalie Thalmann at the MIRALab, in 2008 we began a collaboration with Dr. Hyeong Seok Ko and the Digital Clothing lab at Seoul National University (SNU) to animate historic fashion.
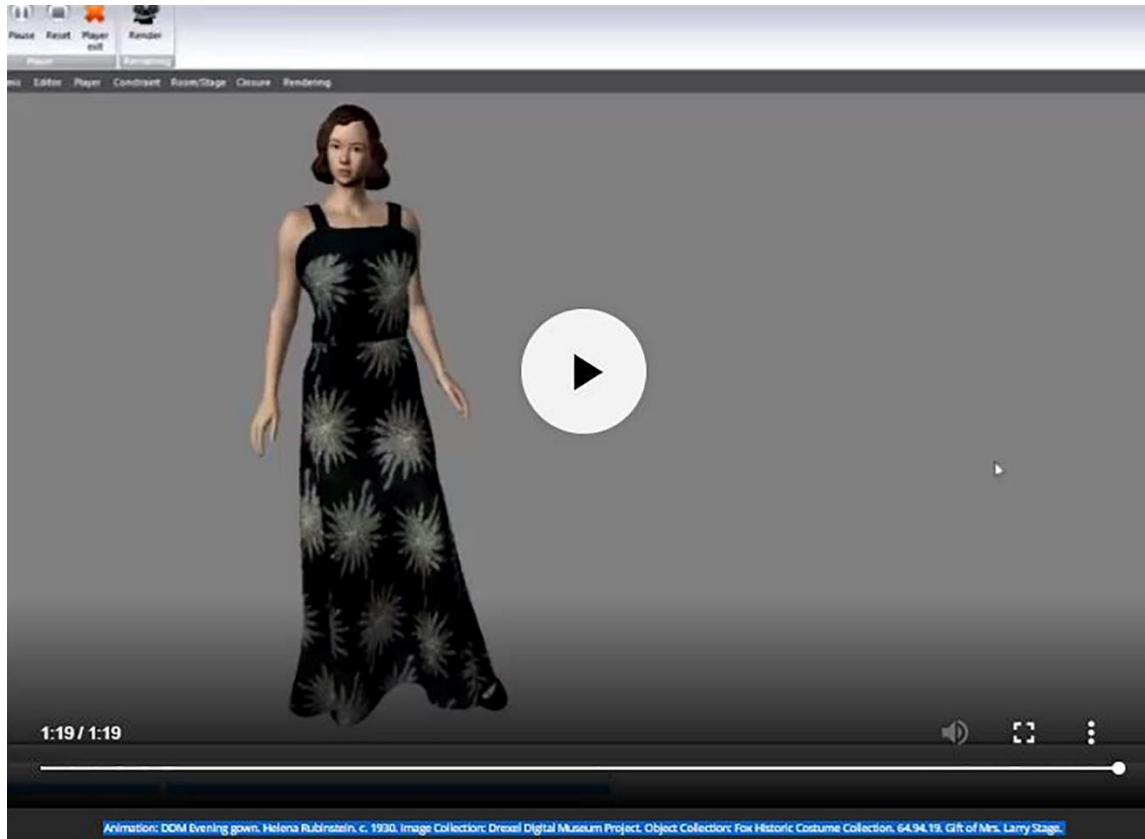
Figure 5: Animation produced by Kathi Martin, Drexel Digital Museum, and the Digital Clothing Group, Seoul National University. Evening Gown. Helena Rubinstein. 1930. Image Collection: Drexel Digital Museum. Object Collection: Fox Historic Costume Collection. 64

The animation opens with a QuickTime video of a Helen Rubenstein gown from 1930. Using measurement specifications taken from the gown patterns were made in the Digital Clothing Suite, a 3D fashion design software being developed at SNU. The patterns were used to recreate the gown on an avatar whose measurements were customized to match the patterns, creating a body of the same proportions of the owner of the gown. Surface design and material properties for the silk plain weave fabric from which the physical gown is constructed were added. Preset motion capture and proprietary computation allow us to see the gown in motion.

Access to the Images

To provide easy and open access, persistence, and to potentially engage in the community of linked open data we are incorporating evolving metadata standards to manage collections of these artifacts. At the moment we use CollectiveAccess, an open source collections management software for the archive backend. In our presentation for ICOM 2017 we discussed our work with the Drexel Libraries Group in a Metadata Object Description project to prepare our files for storage on their digital repository for faculty research, iDEA. An ongoing challenge is universally accepted descriptive terminology for historic fashion. We are very interested in incorporating the work of Ykje Wildenborg and her colleagues from MoMu on the Visuele Thesaurus voor Mode and Kostuums and the Europeana Fashion Thesaurus. In her paper for ICOM 2016 she describes their work to create identifier tags for controlled vocabulary which correspond to concepts which include preferred names, alternative terms, translations

and a description. Plans for the Visuele Thesaurus voor Mode and Kostuums include a line drawing of the fashion object. The idea of using concepts, as opposed to specific terms, to describe fashion objects could link together the variant terms of fashion vocabularies and overcome the problems of describing fashion to a multilingual, global community (Wildenborg 2016).

ObjectVR on the World Wide Web

The most democratic means of creating access to our virtual reality fashion objects is through the world wide web. The Internet has greatly affected information delivery systems and the possibilities for engaging with cultural objects. We repurpose our ObjectVR files as web ready HTML5, a developing mark-up language standard for structuring and presenting multi-media and graphic elements online. Wordpress is the most popular open source content management system on the web with 25% of the Alexa Top 10 million sited using it. There are over 40,000 free plugins on the Wordpress.org site alone under the General Public License (Alexa 2018). We chose to use the PanoPress plugin because it supports the inline embedding of Flash and HTML5 movies and images that are compatible with our customized responsive DDM WordPress theme. This plugin enables us to position text and additional content on either side, above and below the HTML5 content windows without having to alter the output file. This works well on desktop, laptop and tablet. We continue to finesse the player for display on a variety of phones and across platforms for ultimately linking to open repositories.
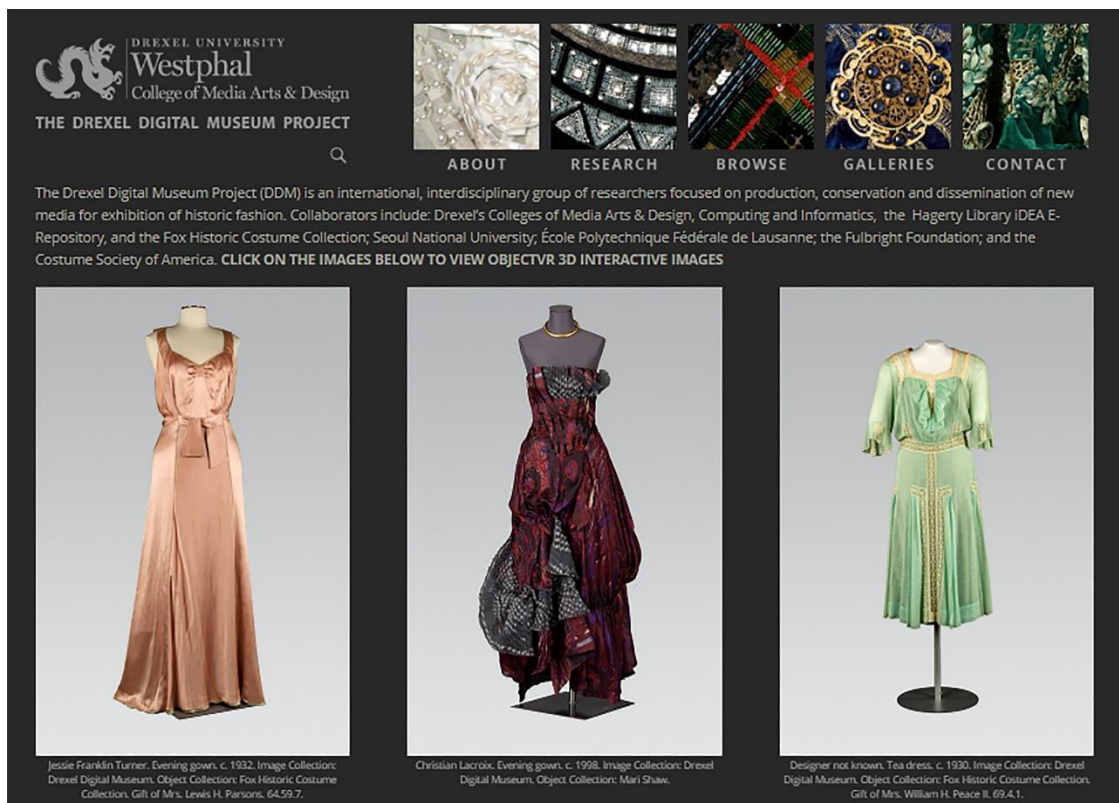

Figure 6: Screen shot Drexel Digital Museum.

Future Exhibition Possibilities

Exhibition design can be enhanced by how this technology can effect the emotional and experiential qualities of viewers' interaction with artifacts. Interactivity can be used to create a participatory visitor experience, which responds to users' various learning styles, interests and knowledge (Fry and Holland 2013). A recent University Scholarly Research award enabled us to purchase a 70 inch vertical monitor. On it will be displayed life size ObjectVR of selections from the archive of American fashion designer James Galanos as part of the exhibition James Galanos: Design Integrity,*(October 19-December 8, January 8-27, 2019 in the Leonard Pearlstein Gallery, Drexel University).* Our Fox Historic Costume Collection, formerly the DHCC, received Galanos' entire 800 piece archive from his foundation last year. Included in the user interface to the monitor will be links to ephemera about the object and designer and way finding to the analogue (physical) object within the exhibition, creating the possibility for a user generated, non-linear narrative.

Conclusion

Software, documenting processes, and collections and website management systems, can enable intelligent and user controlled access of media, ultimately incorporating entire archives through linked open data. By its nature, the website experience is participatory. An individual's online search requires the user to apply the constraints of natural language and/or image matches. Linked to our online archive, the user can direct their experience according to their learning preferences and interact with the individual digital cultural object. Our research in ObjectVR makes the interaction even more personal, driven by the viewer's reaction to color, silhouette and embellishment rather than guided by a particular curator's specific and fixed interpretive structure. In the upcoming Galanos exhibition we hope to bring to the audience a new kind of exhibition that mediates between the physical and the virtual object and creates comparisons and relationships driven by personal insights. We hope to collect user reactions to assess how these new technologies affect interaction, introspection and engagement with historic fashion.

Figure 7: Detail, Tea Dress. Designer not known. 1930. Image Collection: Drexel Digital Museum. Object Collection: Fox Historic Costume Collection.

Acknowledgements

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