Design Research Artifacts: Ways of Seeing, Ways of Saying

Zachary Winegardner
The Ohio State University
Columbus, OH, USA
Winegardner.55@osu.edu

ABSTRACT

In this paper I will describe how the role of digital design artifacts created in the process of research through design can enhance the designer's ability to observe, reveal, analyze, and articulate the construction of complex visual data. The subject of classical paintings serves as an exemplary model that embodies complex visual data. During the research process, design artifacts are produced that help to reveal and discover formal elements of the painting's construction. I will demonstrate this through a reconstruction of Jaques Louis David's *Oath of the Horatii* neoclassical painting. As we explore alternative ways of gathering information in design research, it is equally important to explore ideas of alternative ways of communicating the knowledge that we gather. Artifacts can become a malleable form that can allows us to generate knowledge as well as articulate it while maintaining elements of engagement, exploration, and discovery.

Author Keywords

Design research, research through design, artifacts.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

As the world looks for alternative methods of learning, so do we, as researchers, look for alternative ways of discovering. At their core, researchers are learners as well. In design research, the artifact plays a significant role in the process of generating new knowledge. In "On the Presentation and Production of Design Research Artifacts in HCI," James Pierce talks about the new ways of doing research and the role of design research artifacts for the purpose of "advocating a research agenda or reflecting a design process" [4]. There have been precedent artifacts that articulate the complexities of paintings; however, these artifacts are "operational," and oriented towards users rather than research. Pierce encourages discussion about the

"production," of design research artifacts, referencing the process of creating, exploring, and generating knowledge via research through design making. I will be discussing the production of my artifact, which consists of reconstructing the space and figures of a neoclassical painting as a 3D virtual environment. With the aid of digital media tools, the process of creating this artifact generates new methods of inquiry. By relying on my own visual literacy, curiosity, and technical skills, I am able to expand upon these inquiries and use the artifact with the act of making to investigate my questions. This process provides a deeper analysis of the panting's construction and how that construction is related to its meaning; ultimately a greater understanding of the painting emerges in a way that is only possible through the act of making with digital tools.

I would also argue that artifacts in production can become malleable forms that aid us in transitioning into the dissemination of generated knowledge. In addition to discussing the production of artifacts, Pierce advocates for exploring the ways we might present design research artifacts and make them public. I advocate for further exploration of the design research artifact after generating knowledge. This can uncover ways to present it for sharing the new understandings with a broad and less experienced audience, while maintaining the acts of exploration and discovery in which we, as researchers and designers, participate.

PRODUCING AND EXPERIENCIAL LEARNING

The essence of my design research artifact in both production and presentation boils down to experiential learning. It follows David Kolb's learning cycle, of experience, reflection, conceptualizing, and experimenting. In the process of making for the purpose of understanding the complex visuals of classical paintings, this cycle is represented with respect to Kolb's cycle as: creating, generating inquiry, hypothesizing/finding investigation technique, testing inquiry through artifact. However, there are some noted issues with experiential learning. One critique of the cycle is that it is too sequenced [5]. I agree that this cycle is more of a guideline for describing the process of learning during the production of the design research artifact, as you will see in my own process.

ARTIFACTS FOR GENERATING KNOWLEDGE

My artifact is a 3D reconstruction of the scene represented in Jaques Louis David's painting, *Oath of the Horatii*. This artifact began as an action-based research response to the general question of, "how might we reconstruct a realism painting in 3D?" I went through cycles of learning between making and thought while constructing phases that analyzed the painting's space, figures, and lighting. During its construction, I was constantly reflecting and comparing my working discoveries with a model of my understanding of the original, thus allowing me to spot inconsistencies and curiosities that called for inquiry and further investigation. I used specific advanced visualization tools, like Autodesk Maya, Unity 3D, Oculus Rift, and Adobe Photoshop, to both construct the scene *and* pursue inquiry. During production, I create elements of the scene to mimic the painting. When something seems inconsistent, difficult, or generally curious, inquiry is generated and the artifact is used to investigate. An example of this is posing figures in the scene with proportional human models. When this does not seem possible, I look deeper and use tools to test my conceptualization of the issue at hand; the resulting conclusion informs me that the painted proportions are greatly manipulated. The process may undulate between making, hypothesizing, testing, reflecting, back to making, etc. Some stages occur simultaneously.
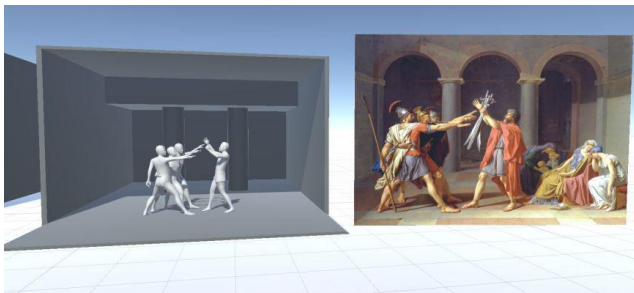

Figure 1. The original image of Oath of the Horatii (right) and my 3D reconstruction being compared in Unity with Oculus Rift virtual reality

This process is exemplary of Diana Laurillard's description of iterative feedback loops through a model of practice. With the aid of the artifact, I am able to run this cycle on my own as a formal learner [2]. It is also representative of rhizomatic learning. This method of gathering knowledge that adapts to the situation at hand does not require a specific or static objective [1]. During this process, my tasks are redefined while inquiry sprouts like a rhizome, fertilized by the act of making. This artifact in production is very much a generative research tool that allows me to formulate and investigate questions that uncover new perspectives and understandings about the painting.

IMPLICATIONS OF PRESENTATION

In terms of the presentation of the artifact, I am framing it as a way to present the knowledge that has been generated from the design research artifact in production. This leads to the question of, "how do you filter complex data into a form that can communicate to a broad audience?" This becomes more problematic. For a general viewer, this data may not be as impactful, especially if the information embodied by the artifact is articulated implicitly, as stressed by Pierce [4]. As this research develops, I attempt to create an artifact that can articulate both implicitly and explicitly while maintaining an essence of experiential learning. This is why it is important to return to the original artifact that has led to new knowledge during its production. During the production stage, the artifact was able to facilitate the discovery of dense and complex information in a unique way. The manner in which this occurs can become influential to the method of presenting dense information. My pursuit is also inspired by precedent artifacts, which possess flexible experiences of viewing while maintaining a sense of explicit articulation.

Pieter van Huystee Film, NTR's "Jheronimus Bosch, the Garden of Earthly Delights, An Online Interactive Adventure," is an interactive and exploratory artifact in which a digital representation of the painting with proximal audio can be actively viewed by repositioning and rescaling [3]. There are two options in the experience: A guided tour takes a viewer on a predetermined path with commentary while a free roam mode allows for open exploration. This is an example of how implicit and explicit can coincide in an experiential learning approach.

Additionally, the data visualization "Synchronous Objects," by Advanced Computing Center for the Arts and Design and Department of Dance at The Ohio State University and The Forsythe Company exemplifies this model. This work, consists of multiple abstract data visualizations that represent specific patterns observed from a dance choreographed by William Forsythe [6]. The various visualizations allow a viewer to explore their construction and relationship with the dance, with additional annotation and commentary that serves as the explicit articulation.

Using this content and the current state of my artifact, I foresee the presented artifact becoming a form that communicates to a generalized audience in a way that mimics the experiential learning and discovery of design research artifact production.

CONCLUSION

The design artifact can become a living thing that transforms and adapts to what it needs to be at the time. By employing digital media in the action-based research of complex visuals, it is possible to create an artifact that can adapt to multiple purposes. It can serve in both the initiation *and* investigating of inquiry, fueled by visual literacy and knowledge of digital design tools. Under further review, it has potential to enable an active discovery of the presented resulting data. The way artifacts help us gather and construct knowledge can become an influential component of the way we approach presenting to a broad audience.

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