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Museum and University Collaboration in Media Conservation Research

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ABSTRACT

Media art conservation requires many forms of research to implement strategies for long-term preservation. Standard research includes investigating original playback equipment, staying abreast of emerging audio, video, and software technologies, and communicating with artists about technologies they use and their exhibition preferences. Media conservation also requires primary research to develop strategies for new technologies that artists use in their production. Museums are well served by establishing relationships with local universities to

conduct some of this research. Academic faculty and students can assist media conservation in many ways, from answering technical questions to engaging in more extensive collaborations. In this article the authors present a model for collaborative university and museum research based on an extensive three-year project they conducted at the Museum of Modern Art and New York University. Students from the university worked with the authors to carry out technical research on three software-based artworks. The model is described in terms of pedagogical goals, project development, and project implementation. The aim is to stimulate similar cross-institutional research in which no funding is required, all parties benefit, and findings are disseminated through publication.

INTRODUCTION

Over the past seven years a number of collaborative projects conducted by the Museum of Modern Art (MoMA) and New York University (NYU) provided valuable information to the museum, learning opportunities for students, and research data for publications. Programs and departments involved in these projects at NYU include the Courant Institute of Mathematics, the Moving Image Archiving and Preservation Program (MIAP), the Museum Studies Program, and the Institute of Fine Arts.

The aim of this article is to present a model for conservators at museums to work with university professors and their students in collaborative research projects. The research needs are well known to readers of publications by the Electronic Media Group. Rather than focus on these needs, we address structural and logistical issues associated with joint museum and university research. Given the limited resources available to museums, joint institutional research projects in which no funds are required can benefit all parties. The success of each project depends on clear articulation of and agreement on project goals, as well as an

understanding of the responsibilities of everyone involved and a well-conceived schedule of activities.

Although there is considerable overlap of institutional and individual interests in university and museum research projects, they are not perfectly aligned. On the highest level, the mission of most museums includes the acquisition, exhibition, and conservation of their collections, as well as public education. Museum mission statements usually do not include collections research. Therefore resources, including staff time, are rarely devoted to research that is not linked to exhibition or remedial conservation projects. Media conservators often find it difficult to allocate the considerable time required for research and deep documentation that is necessary for long-term conservation needs.

The mission of most universities is to educate students and advance knowledge. Strategies for achieving these goals include teaching, research, and publication. There is considerable common ground between universities and museums regarding research, yet there are important differences of which everyone should be aware. A primary difference is that conservators need applied results from their research. They need to make use of their findings, whether it is for a specific conservation intervention or for technical documentation to serve staff in the future. University faculty seek research projects that offer pedagogical and publishing opportunities. Academic publications focus on the production of new knowledge, although they are often based on data from applied research.

Another important difference between universities and museums is in the dissemination of knowledge. Unlike most museum staff members, university professors are required to publish to advance their careers. Academic faculty need to publish articles in peer-reviewed journals and write books with university presses. They must publish new, defensible conclusions based on careful research and analysis. Any conservator who has published in a peer-reviewed journal such

as the *Journal for the American Institute for Conservation* or *Studies in Conservation* is well aware of the amount of time required to satisfy professional reviewers and editors. Conservators are encouraged by their museums to communicate their work to the public online through blogs, videos, and reports describing results of their technical analysis. Although some conservators may want to publish academic articles, the goals of their institutions are more directed towards attracting people to websites and expanding visitation and museum membership.

The success of any joint research project depends on understanding individual and institutional goals, as much as the actual research problem. It also depends on careful planning in advance. We found that clearly defining the scope and aims of the project at the beginning helped structure the project stages. For pedagogical purposes, museum staff need to spend time with student researchers by giving them behind-the-scene tours, describing how conservation functions in the museum, and providing an opportunity for them to present their results at the museum. Museums in turn need concise reports with data from students and faculty, with recommendations for conservation and future documentation strategies. Faculty need access to the research data to draft their publications. This access includes the rights to publish the data and images generated during the research. At times, permission must be gained from artists to publish information about their work. It is helpful to define the roles and responsibilities of all key players at the beginning, and make sure that other impacted staff, not to mention supervisors, are well aware of time commitments and project resource needs.

After defining research aims, project stages must be developed that fit within other staff commitments and institutional needs. The university schedule has an annual rhythm. Faculty have more time to develop projects and write between semesters, whereas students need to be introduced to projects, perform their research, and write their reports within a semester time block. Museums have

their own scheduling rhythms, often associated with exhibitions and acquisition projects.

MoMA AND NYU JOINT RESEARCH PROJECTS

The position of Media Conservator at MoMA was established in 2007, although author Glenn Wharton, who assumed the position, began researching the collection in 2005 on a part time grant from the museum. Since he was already a half-time faculty member at NYU, student and faculty research was part of the initial focus of the media conservation program he developed. This included museum staff lectures in classrooms, symposia at the university and the museum, and both student and faculty research projects on individual artworks in the collection. Several projects that characterize joint research between the museum and the university are described below.

Starting in 2007, classes from the Museum Studies and MIAP programs regularly conducted research on MoMA's media collection. Under faculty supervision, students studied the museum's internal documentation and researched artwork technologies and artist concerns for artwork presentation. Often the students interviewed the artists at the museum, in participation with staff conservators and curators. Reports from class projects greatly extended the museum's capacity to conduct its own research. For instance, students from the Handling Complex Media class in the MIAP program performed research on Max visual programming language and interviewed two programmers who used it to program two artworks at MoMA. Their technical report and the interview transcript help museum staff in their risk assessments of the two artworks.

In 2009–2010, a one-year project at NYU, titled the Conservation of Computer-Based Art Working Group, explored research interests at the university. The

project was co-directed by Howard Besser, Deena Engel, Mona Jimenez, and Glenn Wharton. It was funded by the Visual Arts Initiative at New York University, as detailed in the *Conservation of Computer-Based Art Working Group Project Report* (Wharton et. al 2010) The group conducted four meetings that enabled faculty and graduate students to learn about the research concerns of media conservation within museums. The aim of the project was to identify individuals within the university with research interests in the conservation of software-based art, and to develop strategies for future research. During the fourth meeting, professors Deena Engel and Mona Jimenez interviewed artist Sep Kamvar (b. 1977), who is represented in MoMA's collection.

In 2011, Fernando Domínguez Rubio, a post-doctoral fellow in sociology, co-taught a graduate seminar with Glenn Wharton at NYU, and in 2012 he interned in media conservation at MoMA.[1] Through participant observation research, their combined aims were to investigate the conservation of media art in the context of challenges to traditional framing of authenticity and authorship, along with a larger analysis of collective memory in our contemporary digital culture. As an intern, Fernando Domínguez Rubio performed basic tasks in the media conservation lab, while keeping a journal of daily activities and interviewing staff at the museum. This embedded approach to qualitative research and knowledge production led to a number of co-authored presentations and publications.[2]

In 2009, Deena Engel was invited by MoMA to conduct risk assessments of three software-based works as part of a Matters in Media Art project.[3] Risks assessed in this study included the potential impact of changes and upgrades to hardware, operating systems, and programming languages that would render the software obsolete. Based on the three risk assessment reports generated from the study, we developed a risk analysis template that could be applied to additional works in the collection. The template was later published as an appendix to an article (Engel and Wharton 2014). Following the initial risk assessments performed by Engel,

MoMA conducted ten more assessments. A number of these assessments were aided by student research from classes in the MIAP Program at NYU.

After analyzing the risks associated with these thirteen artworks, we concluded that artist generated source code is a primary concern that needed further research. In addition to the risks associated with source code for all software applications (such as changes to the underlying operating system, changes to the hardware used, changes to the programming language, and other factors), we were concerned that the custom designed source code developed by the artist or contracted programmers is frequently at additional risk due to the lack of technical documentation provided with the source code.

In 2010 a new project was launched to investigate the potential of adapting models from software engineering to create technical documentation of artist rendered source code. This documentation will provide information to future programmers to recompile or re-write the code for new operating environments. Over the course of three years, small teams of undergraduate students in Computer Science and graduate students in Museum Studies at NYU were selected by the authors to create technical documentation for the source code of three artworks. The initial results of this research were published in 2014 (Engel and Wharton). A second article, titled "Source Code Analysis as a Tool for Technical Art History," was published the following year (Engel and Wharton 2015). It describes the potential for using source code analysis in art historical research. In the following sections we describe the development and implementation of this project, and offer suggestions for other museums that are interested in conducting similar projects with local universities.

PEDAGOGICAL GOALS

The pedagogical goals of the source code documentation project include introducing students to the experience of doing original research, writing up their results, and presenting their results in a formal setting.

Most works of software art are written at a level of complexity that is appropriate for advanced undergraduate computer science major students so these artworks pose an unusual opportunity for students at this level to do original research.The students are required to write up their research including contextualization of their work, a description of their methods, a summary of their findings, suggested next steps, and a bibliography. These projects each concluded with a final meeting with museum staff to give the students the opportunity to present their work in a formal setting so that they gain the experience of giving a formal talk and handling a Q&A period thereafter.

The model of museum and university collaboration described here is not about getting free student labor. It is an exchange in which both institutions contribute to fulfill all of the goals. Considerable time is required by the museum staff to prepare for the research and by the faculty member to supervise and guide the students. In order to make these projects work so that they are truly a win–win for both the museum and the academic institution, it is important to partner with one or more faculty members who are aware of specific pedagogical goals and can tailor the projects to meet departmental academic standards, who are familiar with the museum's goals and needs, and who have a deep interest in the research that is generated. These goals can be accomplished in ways that serve the needs of the students and faculty and benefit the museum.

There is a long lead-time required for these projects in order to coordinate and identify strong students and appropriate artworks. The time spent on preparation serves to insure valuable results for the museum, good academic experience for the students, and valuable results for faculty in their need to conduct and publish

research.

Preparation for each project begins with selecting the work of art to study. The selection of the artwork is the result of collaboration between the conservator and faculty member. The museum benefits from selecting one or more works of art that are significant to the museum's collection so that the artwork and its conservation are important to the museum and future exhibitions. Additional criteria include whether the museum can reasonably anticipate the artist's permission for such a study and possibly benefit from the artist's participation. The museum must address any copyright issues that require attention before embarking on the study. The museum staff must also evaluate the work of art under consideration to insure that it has suitable components (e.g., the data files are available, special hardware is not needed for the study, and there is no cost).

From an academic perspective, the faculty member provides guidance on selecting one or more works of art that are sufficiently complex—both with respect to the source code and to the configuration of the work as a whole—as to support a research project; and to select a variety of works of art over time in order to ensure valuable research outcomes. The faculty member assesses the works of art for the project by asking whether it poses interesting research questions. The faculty member further evaluates potential works of art for study by examining a number of aspects, including the state of the source code to determine the programming language and version (e.g., whether it is a dead or living programming language); the level of programming difficulty in the source code itself; whether the work of art was programmed by the artist or a hired programmer; how "clean" the code appears to be and other guidelines. In some cases, the faculty member also considers the hardware environment, operating system, and other factors.

PROJECT DEVELOPMENT AND IMPLEMENTATION

Upon selecting one or more works of art, the planning can begin. The faculty member decides how many students may participate and in what structure (e.g., is this a class project, a small group project, etc.) in order to define how many students to accept and the skills the students must have in order to participate. From a planning perspective, one must also bear the academic semester calendar in mind so that projects can begin and end within appropriate time frames for the students to get academic credit for their work and coordinate their research with other academic responsibilities. Depending on the nature of the artwork, qualified students might come from one of several computer science academic programs such as advanced undergraduate computer science major students, graduate students in computer science, or
undergraduate students with a major in the arts or the humanities and a minor in computer science.

It is the faculty member's responsibility to select the students. It is also the faculty member's responsibility to ensure that the research project is set up to meet academic research requirements within the computer science department so that the students can receive either independent study or research credit towards graduation for these projects.

Once the artwork has been selected and the project has begun, it is important to have an initial meeting at the museum or conservation lab so that the computer science students can learn about art conservation in general and about conserving time-based media in particular. This is also an opportunity to introduce the computer science students to a museum staff member, graduate student in art conservation, or a museum fellow who will work with the students with respect to answering questions about the artwork and contextualize the work within the artist's oeuvre and the museum collection. Collaboration with an expert outside of

the computer science field is another benefit for computer science students who often find that they need to think carefully about how they explain technical aspects of the artwork to a non-expert. During the course of the semester, students are expected to meet with their faculty advisor on the project on a weekly basis to discuss their research and to ensure that the project is progressing in a timely manner. The students work throughout the semester to prepare three deliverables to the museum at the end of the semester: the final report, the presentation at the museum, and slides for the presentation.

The museum staff representative schedules, hosts, and participates in the students' presentation near the end of the term. This is an opportunity for the students to discuss their research and the results. In addition to giving a 20–30 minute talk, the students prepare for a Q&A period so that they can answer questions for the museum staff about the work of art and their recommendations for future conservation.

The students submit a collaboratively written report that is the result of their research to the museum staff at this meeting (typically 20–40 pages including narrative, charts, citations, diagrams, etc.). Students provide a list of software and hardware resources (e.g., URLs for programming languages and libraries) and other resources (e.g., transcripts of artist interviews). The report is prepared during the course of the semester and is co-edited by the faculty member. Students focus on an in-depth analysis of the technical structure of the work, documentation of the source code, conservation risks that they anticipate based on their research, and recommendations for conservation practices for the artwork. Students also submit their lecture slides that they prepared for the presentation to the museum.

In the final stage of the project, at the end of the semester, students receive a grade on their official academic transcript. Student assessment by the faculty

member is based on the quality of their research; their oral presentation at the museum; and the written report.

CONCLUSION

Our intention in this article is to advocate for more joint university and museum collaborations in order to work towards solving media conservation problems and advance the field through research and scholarly publications. The model that we describe contains details that may be specific to the case of source code documentation, but our hope is to help frame research projects to accommodate the conservation needs at other institutions and for other electronic media in the future.

We are experiencing an exciting moment, as the field of media conservation continues to evolve and digital art technologies rapidly advance. Today's students at universities and interns at museums will be the professionals and scholars of the future. Both museums and universities will serve the next generation well by fostering collections research that preserves our contemporary media heritage for future re-exhibition while providing pedagogical opportunities and disseminating knowledge produced through this research.

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NOTES

[1] Fernando Domínguez Rubio received a Post-Doctoral fellowship (2010–2013) from the Marie-Curie Foundation, European Research Council. The Open University in London sponsored the fellowship, and New York University hosted him. The 2011 graduate seminar was titled *The Museum Life of Contemporary Art.*

[2] For instance, the lecture "Co-Production at MoMA," was presented on February 13, 2013 at the College Arts Association annual conference, and an article titled "The Contemporary Art Museum and Fragile Memories of the Digital Age" is currently being completed for publication.

[3] The Matters in Media Art project is a collaboration of the New Art Trust, the Museum of Modern Art, the San Francisco Museum of Modern Art, and Tate. More information can be found on the project website: www.tate.org.uk/about/projects/matters-media-art (accessed July 21, 2014).

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