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Issue Statement

Software obsolescence poses a major threat to the preservation of born-digital records. New advancements in emulation technology are beginning to offer at-scale solutions to this problem. However, with these solutions come new legal and ethical concerns. I advocate for the creation of a national registry and licensing body for obsolete software and more standardized description practices.

<u>Issue Paper: Emerging Solutions and New Challenges in Software Preservation</u>

While digital preservation is now a well-established field within libraries, archives and museums (LAMs), the more niche, yet equally important role of *software* preservation remains underfunded, under-supported and under-recognized. Nevertheless, for reasons both technological and social, software preservation efforts have recently reached an important inflection point, and as old technical problems are finally being solved, new legal, ethical and practical challenges are beginning to arise. In this paper, after documenting the necessity and difficulty of software preservation, I examine the impact of emerging emulation technologies rooted in networked, shared access to obsolete software. Finally, I advocate for more widespread institutional awareness of software preservation issues, the creation of a national registry and licensing body for obsolete software and more standardized descriptive practices for born-digital objects.

1. <u>Why Software Preservation Matters</u>

LAMs preserve software for two primary reasons: first, as a tool to access the complex digital objects in their collections and second, to facilitate the study of software as an object itself. The first, utilitarian purpose of software preservation grants archivists and users the ability to decipher text files in obsolete formats, maintain the full functionality of program files, or access visualizations without substantially altering the original display of the images.[1] The accessibility of legacy data relies heavily on the ability to retain the "software dependent elements" in their original display environments.[2] Further, this utilitarian use is also becoming

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[1] Euan Cochrane, "Rendering Matters-Report on the Results of Research into Digital Object Rendering," *Archives New Zealand*, 2012, accessed March 31, 2019, http://archives.govt.nz/sites/default/files/rendering_matters.pdf.
[2] Kendra Albert, "A Victory for Software Preservation: DMCA Exemption Granted for SPN," *Cyberlaw Clinic* (blog), October 26, 2018, accessed March 20, 2019, http://clinic.cyber.harvard.edu/2018/10/26/a-victory-for-software-preservation-dmca-exemption-granted-for-spn/.

increasingly important in examining the reproducibility of scientific experiments and the

accuracy of archived datasets. Scientific processes and equipment increasingly rely on

customized and unique software specifications, and thus the preservation of this code is essential

to the verifiability of the resulting scientific data. As Douglas Thain, Peter Ivie, and Haiyan

Mengoutline explain in a 2015 report, "unfortunately, this [reliance on computers] has made the

problem of scientific reproducibility even harder, due to the complexity and imprecision of

specifying and recreating the computing environments needed to run a given piece of software."[3]

Without extensive continuous efforts to document computing environments and preserve legacy

software, we are in danger of forever losing access to important cultural and scientific

information.

The second purpose of software preservation, the study of software as a subject itself, is

producing a growing body of important scholarly research in a wide range of academic

disciplines. For instance, Mathew Kirschenbaum's *Track Changes* examines the influence of

word processing software on the history of writing[4] and recent scholarly work by Erica Robles-

Anderson and Patrik Svensson explores how the ubiquity of PowerPoint "provides a common

infrastructure, a template for the organization of speech, and for the logic of argumentation."[5]

Universities around the world continue to add new programs and degrees in the field of Game

Studies[6] and since 2009, MIT Press has regularly published new scholarly texts under their

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[3] Douglas Thain, Peter Ivie, and Haiyan Meng, "Techniques for Preserving Scientific Software Executions: Preserve the Mess or Encourage Cleanliness?," in *Proceedings of the 12th International Conference on Digital Preservation (IPRES)*, 2015, 164–174. https://daspos.crc.nd.edu/images/reports/techniques-ipres-2015.pdf, 1.

[4] Matthew G. Kirschenbaum, *Track Changes* (Harvard University Press, 2016).

[5] Erica Robles-Anderson and Patrik Svensson, "'One Damn Slide After Another': PowerPoint at Every Occasion for Speech," *Computational Culture*, no. 5 (2016), http://computationalculture.net/one-damn-slide-after-another-powerpoint-at-every-occasion-for-speech/.

[6] For example, see *USC Games*, https://games.usc.edu/ and *NYU Game Center*, https://gamecenter.nyu.edu/academics/. For a more comprehensive accounting of the emerging academic discipline of game studies see Bonnie Ruberg, "Getting a Game Studies PhD: A Guide for Aspiring Video Game Scholars," Blog, *Our Glass Lake* (blog), last updated March 2018, http://ourglasslake.com/getting-into-game-studies/.

Software Studies Series.[7] For these burgeoning fields of scholarship to continue, researchers

must have access to accurate and complete "complex digital objects" in their original computing

environments.[8] Every day, computers play a more central role in all manners of cultural

production, from visual art, music and time-based media to engineering, healthcare,

transportation and particle physics. Thus, maintaining a trustworthy record of this cultural output

necessitates the accurate and reliable preservation of the software used to produce and access it.

2. The Unique Technical Challenges of Software Preservation

While traditional physical media objects like books, photographs and film can last for

centuries with proper storage and care, born-digital objects like software tend to have a much

shorter lifespan.[9] In addition to the physical and material decay known as "bit rot," digital

objects like executable program files are also highly susceptible to format obsolescence. As a

recent report from the Association of Research Librarians points out, "because of the rates at

which digital media deteriorates and digital technology shifts, our ability to access software just

a few years after its release is highly endangered—and the knowledge that depends on that

software is therefore at risk."[10] Paired with the degradation of physical media, the rapid rate of

technological change in computing entails that digital preservationists must devote a

considerable amount of their time, resources and energy to maintaining, updating and preserving

the software in their collections, even when it is only a few years old.[11]

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[7] MIT Press, "Software Studies," accessed March 20, 2019, https://mitpress.mit.edu/books/series/software-studies
[8] Allen Foster and Pauline Rafferty, *Managing Digital Cultural Objects: Analysis, Discovery and Retrieval* (Neal-Schuman Publishers, 2016), 24. Foster and Rafferty define "complex digital objects" as "discrete digital objects that are made by combining a number of other digital objects, again accompanied by identifying metadata."
[9] Jean-François Blanchette, "A Material History of Bits," *Journal of the American Society for Information Science and Technology* 62, no. 6 (2011): 1042–1057.
[10] Patricia Aufderheide et al., "The Copyright Permissions Culture in Software Preservation and Its Implications for the Cultural Record" (Association of Research Libraries, February 9, 2018),
https://www.arl.org/storage/documents/2018.02.09_CopyrightPermissionsCulture.pdf., 5
[11] Shira Peltzman personal interview with the author, Los Angeles, November 29, 2018.

Moreover, as software becomes obsolete and digital objects become unreadable on contemporary machines, digital preservationists must find new ways to access older files. For decades, this issue has primarily been addressed by migrating data to updated formats that are accessible through contemporary computers with backwards compatibility.[12] For example, using specialized hardware and digital forensics tools, archivists can create disk images of floppy disks that are then interpretable by non-obsolete software. But while migration has been a successful strategy in stabilizing and storing some otherwise at-risk information, it proves inadequate for providing access to more complex digital objects or preserving software itself. As Stewart Granger explains, "[migration] has both dangers and costs. The notable danger is that of data loss, or in some cases the loss of original functionality or the look and feel of the original platform."[13] While there are many programs that offer backwards compatibility with older file formats, recent research has shown that "when files are rendered in environments that differ from the original then they will often present altered information to the user."[14] Thus, it is not enough to migrate and store data, archivists must also preserve the computing environment in which that data is rendered. As digital objects have become more complex and increasingly dependent on specific hardware and software requirements, migration, in turn, has become a less viable and useful option for preservation.

Moreover, software preservation poses a unique challenge due to the lack of institutional infrastructure and support, and the inadequacy of an institution-by-institution approach. As UCLA Library Digital Archivist Shira Peltzman indicated in a recent interview, in digital

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[12] Dianne Dietrich et al., "How to Party Like It's 1999: Emulation for Everyone," *The Code4Lib Journal*, no. 32 (April 25, 2016), http://journal.code4lib.org/articles/11386.
[13] Stewart Granger, "Emulation as a Digital Preservation Strategy," *D-Lib Magazine* 6, no. 10 (October 2000), https://doi.org/10.1045/october2000-granger.
[14] Cochrane, "Rendering Matters-Report on the Results of Research into Digital Object Rendering."

preservation "access usually comes last…it's a can people keep kicking down the road."[15] At

UCLA Libraries, curators often accession collections containing born-digital objects without a

firm understanding of the software and infrastructure requirements needed to provide authentic

access to those objects.[16] Through an extensive survey conducted in 2014, the Software

Preservation Network (SPN) found that "there is a professional awareness of the importance of

software preservation, but very few organizations have been prepared to embark on software

preservation projects of their own."[17] And furthermore, as a report from the ARL concludes,

"most [institutions] cannot support a comprehensive library of software, expert staff, and related

tools."[18] The huge scale of this problem necessitates a more collaborative approach. For all these

reasons, LAMs are now turning to new, shared, collective, at-scale solutions.

3. Emerging Solutions – Emulation as a Service

To approach the problem of obsolescence at scale, software preservationists are

beginning to move away from a model focused on migration and backwards compatibility to a

new model rooted in emulation. Emulation is not a new technology, and it has been used for

preservation and access purposes dating back to at least 1995, including, most famously, in

Emory University's processing of the Salman Rushdie papers in 2007.[19] However, due to its

prohibitive costs and advanced technical knowledge requirements, it has only recently

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[15] Peltzman, personal interview with the author, Los Angeles, November 29, 2018.
[16] For example, Peltzman noted that UCLA Library Special Collections has accessioned multiple collections containing complete Macintosh computers, but the digital archive currently has no way to disk image the hard drives of these machines and lacks the proper obsolete computing environment (hardware and software) to open many of the files.
[17] Jessica Meyerson et al., "The Software Preservation Network (SPN): A Community Effort to Ensure Long Term Access to Digital Cultural Heritage," *D-Lib Magazine* 23, no. 5/6 (May 2017), https://doi.org/10.1045/may2017-meyerson.
[18] "Best Practices for Fair Use in Software Preservation," The Software Preservation Network, accessed December 9, 2018, http://www.softwarepreservationnetwork.org/bp-fair-use/.
[19] Dan Rockmore, "The Digital Life of Salman Rushdie," *The New Yorker,* July 29, 2014, https://www.newyorker.com/tech/annals-of-technology/digital-life-salman-rushdie.

become a viable and accepted option for preservation among LAMs more generally.[20] A full

technical explanation of emulation is beyond the scope of this paper, but essentially it is a means

by which a "virtual machine" is implemented on a host computer. This implementation can then

run "unmodified software binaries" designed for the system running on that virtual machine.[21] In

other words, by virtually imitating a specific configuration of hardware and "machine code,"

emulation allows for software code to be run on computers on which it could normally never run.

Since 2016, several promising emulation-based initiatives have launched, aiming to

preserve legacy software and reshape the way researchers access obsolete digital materials.

Most notably, a project recently initiated at the Yale University Libraries (YUL), in

partnership with the Software Preservation Network (SPN), utilizes and builds upon an

emulation framework developed at the University of Freiberg known as BwFLA –

Emulation-as-a-Service (EaaS).[22] In EaaS, the virtual machines used for emulation are hosted

on networked servers, and cloud computing technologies allow for remote users to access pre-

configured hardware and software environments through the web.[23] As Digital Preservation

Manager at YUL Euan Cochrane explains, "the power of and value of the EaaS approach…is

that it abstracts away the details of which emulator is being used and how it is configured, and

simply provides the preconfigured emulated computers for use in archival/library workflows."[24]

In other words, EaaS allows minimally trained archivists to use a wide range of emulators to

configure computing environments through simple web-based interfaces. The original EaaS

[20] Dianne Dietrich et al., "How to Party Like It's 1999: Emulation for Everyone," *The Code4Lib Journal*, no. 32 (April 25, 2016), http://journal.code4lib.org/articles/11386.

[21] David S.H. Rosenthal, *Emulation & Virtualization as Preservation Strategies*, a report commissioned by The Andrew W. Mellon Foundation, New York, October 2015, https://mellon.org/Rosenthal-Emulation-2015

[22]"BwFLA: Emulation as a Service," accessed March 16, 2019, http://eaas.uni-freiburg.de/.

[23] Rosenthal, "Emulation & Virtualization as Preservation Strategies,"

[24] Euan Cochrane, Jonathan Tilbury, and Oleg Stobbe, "Adding Emulation Functionality to Existing Digital Preservation Infrastructure," *Journal of Digital Media Management* 6, no. 3 (2018): 255–264, 258.

framework has already been used successfully to provide remote users with access to obsolete

software in past projects, most notably in Rhizome and the New Museum's popular 2016 online

exhibition of Theresa Duncan's 1990s CD-ROM games.[25]

At YUL, Software Preservation Program Manager Seth Anderson is working on a three-

year, grant-funded project to scale up this EaaS framework to serve a broader range of users,

establishing EaaS "nodes" at other major collecting institutions around the country. Launched in

late 2018, the Scaling Emulation and Software Preservation Infrastructure (EaaSI) program "is

focused on the development of technology and services that support distributed management,

documentation, sharing, and use of emulated software across a broad range of disciplines."[26]

Simultaneously, through SPN's "Fostering Communities of Practice" initiative, over the next

three years, pilot projects at six institutions will "experiment and test emulation software,

confront specific issues such as legal, metadata, technical preservation, and access challenges

specific to their projects, and ideally bring software preservation and access into the mainstream

of digital preservation practice."[27] In theory, EaaSI will allow LAMs around the country to

collectively store, document and share access to the obsolete software in their collections. So,

rather than each institution needing a full suite of obsolete hardware and software to extract,

migrate and maintain their legacy digital objects, they could simply implement "a node" of the

EaaSI infrastructure and allow users to access digital material using an emulated computer

environment in person, or in a web-based "virtual reading room."[28] This increased access to

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[25] "The Theresa Duncan CD-ROMs," *Rhizome,* accessed March 16, 2019, http://archive.rhizome.org/theresa-duncan-cdroms/.
[26] "About EaaSI – Saving Software Together," Software Preservation Network, accessed March 16, 2019, https://www.softwarepreservationnetwork.org/eaasi/.
[27] "About FCoP – Saving Software Together," Software Preservation Network, accessed March 15, 2019, https://www.softwarepreservationnetwork.org/fcop/.
[28] Euan Cochrane, "Designing a Universal Virtual Interactor (UVI) for Digital Objects - Digital Preservation Coalition," Digital Preservation Coalition, accessed March 16, 2019, https://www.dpconline.org/blog/idpd/designing-a-uvi-for-digital-objects.

born-digital objects through emulated computing environments will force archivists to rethink

many of their standard practices regarding arrangement, description, metadata, and copyright.

4. New Intellectual Property Right Concerns

The first major roadblock facing this new form of software preservation is copyright law.

While shared, distributed access to obsolete software would solve many of the preservation and

access issues listed above, as Seth Anderson admits, it also "obviously raises some questions in

regard to legality."[29] According to Anderson, digital preservationists interested in developing

EaaS are well-aware of the potential intellectual property right concerns in expanding

widespread access to copyrighted software, and to this point, they have mostly relied on an

expansive understanding of the fair use doctrine in their practices. Accordingly, because fair use

is such a notoriously slippery and complex legal concept, in early 2017, the ARL was awarded a

grant to develop and disseminate a *Code of Best Practices in Fair Use for Software*

Preservation.[30] The *Code*, released in September 2018, evaluates the application of the fair use

doctrine in five of the most common software preservation activities, and finds that "fair use

applies to institutions making software available on a cooperative basis to broaden research

opportunities, including off-premises access using technology such as Emulation as a Service."[31]

However, the code also lists four major limitations to the application of fair use in this case.

These limitations all focus on the creation and necessity of specific policies regarding how, when

and to whom access to emulated software environments should be granted. Thus, as EaaS

technologies mature and become more widely available, it will be essential for institutions to

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[29] Seth Anderson, Skype interview the author, November 29, 2018.

[30] "Code of Best Practices in Fair Use for Software Preservation," Software Preservation Network, accessed March 31, 2019, https://www.softwarepreservationnetwork.org/bp-fair-use/

[31] Association of Research Libraries, "Code of Best Practices in Fair Use for Software Preservation," revised February 22, 2019, accessed April 1, 2019, https://www.arl.org/storage/documents/2019.2.28-software-preservation-code-revised.pdf, 11.

begin building the relevant policies and institutional guidelines around researcher access to emulation and shared software. This will require more widespread awareness of the problems of software preservation issues throughout the profession.

My informal conversations with digital preservation professionals, coupled with a review of surveys from within the field,[32] lead to the conclusion that despite the legitimate intellectual property right concerns, archivists must work towards establishing a more centralized, open, shared national repository for legacy software using EaaS. This repository should be a joint project of the SPN, the software industry and perhaps the National Software Reference Library.[33] Otherwise, because fair use applies only to obsolete and commercially unavailable software, as new software continues to flood the market, LAMs will always be playing catch-up in their effort to maintain the necessary tools to preserve born-digital materials. A more collaborative, national effort to not only document, but properly store and preserve new software is necessary. Digital preservation metadata registries such as PREMIS, PRONOM and Wikidata offer promising starts to the documentation of file formats and software, but it is not enough to simply know the technical specifications of a digital object, archivists also need the capacity for continued, reliable access. In order to address these concerns, LAM professionals will need to go beyond a reliance on the fair use doctrine and advocate for major legislative changes to section 108 of the Copyright Act: the exception for libraries and archives.[34] Moreover, within the EaaS community,

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[32] Aufderheide et al., "The Copyright Permissions Culture."

[33] The National Software Reference Library is a program of the US Department of Homeland Security and the National Institute of Standards and Technology that collects software from various sources and "incorporate[s] file profiles computed from this software into a Reference Data Set (RDS) of information." "National Software Reference Library," accessed March 31, 2019, https://www.nist.gov/software-quality-group/national-software-reference-library-nsrl.

[34] US Copyright Office, "Section 108 of Title 17 – A Discussion Document of the Register of Copyrights," 2017, https://www.copyright.gov/policy/section108/discussion-document.pdf. Section 108, enacted with the Copyright Act of 1976, offers special exceptions for authorized libraries and archives to reproduce and distribute copyrighted works, with many added limitations, for the purposes of preservation, replacement, and research. Although greatly limited and outdated, section 108 does allow for many of the important activities involved in digital preservation, most notably, the migration of programs and data from old obsolete formats to new formats capable of being read

there is already a move to create a new licensing model that would treat emulation more like a performance, similar to music streaming. As Cochrane explains, this would allow LAMs to "address licensing by establishing similar organizations to manage it as exist for music. i.e. performance rights organizations (PROs)."[35] The establishment of a central, national organization tasked with licensing software "performance" would be a major step towards clarifying the often confusing and unclear ownership issues that come with outdated and unclear software licensing agreements or orphaned software.

<u>5. Describing Born-Digital Objects in an Age of Emulation</u>

In addition to these copyright concerns, EaaS also brings new archival description and metadata requirements. In a 2018 study, Digital Assets Specialist at the American Folklife Center, Julia Kim observes and documents the way different access methods affect researchers' interaction with digital objects. By examining "different types of emulated, migrated and 'as-is' access on both contemporary and obsolete computers," Kim's study demonstrates that emulation technologies can play a major role in shaping the way researchers understand archival materials. [36] Kim explains that "all researchers commented on the tangible, even visceral experience of the emulation and its departure from contemporary computing."[37] Thus, the study indicates the importance of accurate and transparent description practices for these access methods. Because there are multiple

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through backwards compatibility. More specifically section 108 allows libraries and archives to create and distribute up to three digital copies of published works if they are damaged, deteriorating, lost, stolen, or in an obsolete format *and* no unused copy can be purchased at a fair price. These digital reproductions must remain on the physical premises of the institution.

[35] Erin Engle, "Intellectual Property Rights Issues for Software Emulation: An Interview with Euan Cochrane, Zach Vowell, and Jessica Meyerson | The Signal," webpage, January 22, 2016, //blogs.loc.gov/thesignal/2016/01/intellectual-property-rights-issues-for-software-emulation-an-interview-with-euan-cochrane-zach-vowell-and-jessica-meyerson/.

[36] Julia Kim, "Researcher Access to Born-Digital Collections: An Exploratory Study," *Journal of Contemporary Archival Studies* 5, no. 1 (May 25, 2018), https://elischolar.library.yale.edu/jcas/vol5/iss1/7, 1.

[37] Kim, 9.

competing and experientially different methods for accessing born-digital files, it is essential

for those methods to be explained and divulged to researchers. In summarizing the results of

her findings, Kim suggests that archivists "must preserve bit-exact disk images of

collections, software, and documentation of dependencies, behavior and donor intent in

order to secure the potential for emulation for access and preservation."[38] In other words,

emulation is coming, and we must prepare by accurately documenting the necessary

information for its future use. Additional studies of emulation use, especially Dianne

Dietrich et al.'s 2016 article "How to Party Like it's 1999: Emulation for Everyone," have

also come to similar conclusions on the necessity of clear documentation and description

practices for methods of access.[39]

Along these lines, one major effort to help bolster standardization and collaboration

within born-digital description was recently launched through the publication of the "UC

Guidelines for Born-Digital Archival Description."[40] Responding to a "dearth of internal

policies and procedures for born-digital archival description," the authors consulted the most

widely used archival standards (ISAD(G), DACS, and EAD) and found "a number of areas

where real-world processing practices conflicted with standards."[41] In response, the four

digital archivists produced a new set of guidelines that, among other recommendations,

stress the importance of the "Processing Information Section" on any finding aid that

describes born-digital materials. The authors recognize that born-digital materials can be

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[38] Kim, 11.
[39] Dietrich et al., "How to Party Like It's 1999."
[40] University of California Systemwide Libraries. (2017). *UC Guidelines for Born-Digital Archival Description. UC Office of the President: University of California Systemwide Libraries.* Retrieved from https://escholarship.org/uc/item/9cg222jc.
[41] Annalise Berdini et al., "Describing Digital: The Design and Creation of a Born-Digital Archival Description Standard at the University of California Libraries," *Journal of Western Archives* 9, no. 1 (September 7, 2018), https://digitalcommons.usu.edu/westernarchives/vol9/iss1/10, 5.

processed and accessed in vastly different ways, and that this contextual information is vital for researchers to understand. As Berdini et al. explain, "processing legacy born-digital material can often involve changing the nature of the data to preserve it and make it accessible…it is essential that this information be recorded to ensure that future archivists and users understand … the process by which they are able to access the materials."[42] As EaaS becomes more technically and economically feasible, archivists will need to adjust their description practices and finding aids to account for these new access methods. Building off the principles established in the "UC Guidelines", finding aids of the future will need to describe not only how born-digital materials were accessioned and processed, but also the computing environment and technological context of access. The finding aid of the future will likely look quite different from those used today, and if current trends continue, an accurate description of the process and meaning of software emulation will need to be a part of that finding aid.

<u>6. Conclusion</u>

EaaS cannot solve all the problems of software obsolescence, and these tools come with their own set of thorny new preservation issues going forward. For instance, emulation is itself dependent on software and hardware compatibility and thus susceptible to platform and media obsolescence. Even as the emulation framework becomes more standardized and distributed through EaaSI, archivists must be sure to properly document and preserve changes to the emulators and maintain interoperability with current systems. Moreover, as born-digital objects become more complex and more closely tied to specific hardware requirements (such as multi-touch screens, VR headsets, or other accessories), archivists will need to become familiar with the additional metadata and operational requirements for

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[42] Berdini et al., 8.

"authentic" playback and access. And finally, the preservation of web-dependent and cloud-based software will require an even more collaborative and collective effort to ensure future access to digital material. Software obsolescence has plagued digital preservation efforts for decades, but the technologies needed to address this issue are finally beginning to emerge. Archivists and collecting institutions need to be aware of the issues surrounding these new technologies so that they can be successfully integrated into archival workflows and infrastructure in the future.

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<u>Major Paper</u>
Making Collective Memory: Critical Nostalgia and the Search for Community

Written for IS-289: *Theory and Politics of Collecting* with Prof. Shawn VanCour, Winter 2018

While this paper is not my most academically rigorous or professionally focused, it perfectly captures the core focus of my overlapping interests throughout my time in the program. By focusing on a DIY, queer moving image archive, in this case study I was able to tap into my deep interest in the communal power of collecting and the importance of obsolete media formats like videotape. Now, more than a year since this paper was written, the Roaming Center for Magnetic Alternatives (RCMA) continues to grow and exemplify many of the principles laid out in my study. Moreover, I have recently reconnected with Kendell Harbin and the RCMA and we are currently planning multiple collaborative projects to take place this summer, including a shared artist's residency at the Prelinger Library in San Francisco, California.

Making Collective Memories: Critical Nostalgia and the Search for Community

Drawing on a long tradition within the study of collecting, my work focuses on the collection and practices of an individual collector, Kendell Harbin, an independent archivist and artist working out of Kansas City, Missouri. The primary source of my research is a series of three lengthy phone interviews with Harbin. In addition, I draw from my personal experience as a frequent user of the *Cry Now Free Video Library*, which she ran out of her bedroom, and as an early collaborator in the formation of the Roaming Center for Magnetic Alternatives (RCMA), which is the primary focus of my study. For the sake of full disclosure and transparency, I should also mention that Harbin is a personal friend of mine. Finally, my last caveat is that this project, the RCMA, is less than a year old and still evolving, and due to unforeseen circumstances, it may take on a radically new form in the future. Thus, my paper is somewhat speculative and should be considered a snapshot case study of a DIY queer moving image archive in its early stages of conceptualization and development.

My research draws from traditions within archival studies, queer studies, media studies, and feminist theory. Broadly, I frame my study within a tradition stemming from Walter Benjamin's work on collecting. I use Benjamin to guide a discussion on time, and the way in which collecting the material remnants of the past can be revitalized and utilized in the present. Within this framework, I engage with scholarship on nostalgia and longing. I build an understanding of archives around recent scholarship within queer theory, particularly Ann Cvetkovich's conception of the queer archive as an "archive of feeling." Finally, my argument relies heavily on Marika Cifor's conception of "critical nostalgia," as explicated in her 2017 dissertation "'Your Nostalgia is Killing me': Activism, Affect and the Archives of HIV/AIDS." Cifor defines critical nostalgia as "an ethical mode of critique grounded in the bittersweet

longing for a past time or space."[43] She compares this conception of nostalgia to the more

commonly explored phenomena of "reflective nostalgia," arguing that "critical nostalgia reaches

beyond reflective nostalgia in the extent to which it is both deeply political and socially engaged;

it is a mode of coherent critique that demonstrates more self-consciousness in its awareness and

holds more strategic potential for action than reflective nostalgia allowed for."[44] I use this

concept to guide my exploration of Harbin's project. After a discussion of the origin of the

RCMA out of the *Cry Now Free Video Library*, I will describe the project by looking at three

vital aspects of it: the archive as art, the role of video and videotape technologies, and the "queer

archive" as an affective "archive of feelings." Finally, I will briefly look at two case studies of

recent RCMA digitization projects.

   In his 2007 dissertation, Jae Emerling offers a concise articulation of Walter Benjamin's

conception of collecting: "through a critical philology of the material world, there appears

potentiality, another narration of experience, another re-collection of redemption or happiness:

the 'as-yet unlived' that remains immanent in the present."[45] In applying this thought to a

contemporary DIY collecting institution, I contest that the RCMA offers an example of the

redemptive, and liberating potential of collecting for an historically marginalized community.

More specifically, by creating an "affective archive" the RCMA creates "another narration of

experience" and helps reimagine a new, more just future. Through a lens of "critical nostalgia,"

the RCMA reassembles, reimagines and utilizes the scattered pieces of a community's material

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[43] Marika Louise Cifor, "'Your Nostalgia Is Killing Me': Activism, Affect and the Archives of HIV/AIDS"
(University of California, Los Angeles, 2017), http://escholarship.org/uc/item/2312c9bb, 17.
[44] Cifor, 17.
[45] Jae Emerling, "The Gesture of Collecting: Walter Benjamin and Contemporary Aesthetics" (PhD Thesis,
University of California, Los Angeles, 2007), viii.

history to build and engage with that community's identity in the present, strengthening affective

bonds and fostering a new "collective memory" with eyes toward future action.

In the writings on her website, and in an informational tri-fold pamphlet, Harbin describes

the Roaming Center for Magnetic Alternatives as follows:

> The Roaming Center for Magnetic Alternative (RCMA) is a lending library of over
> 1000 vhs tapes and video technologies traveling Mid-America to connect with
> outlying LGBTQ+ populations. It is an ad hoc media and research center exploring
> the correlation between queer culture, video history, and a medium on the edge of
> obsolescence. Providing free screenings, videography workshops, and equipment
> access, we transform parking lots, strip malls, private venues, and public squares
> into classrooms for communities who wish to uncover and tell their own stories.
> Taking a wider view, our research examines the role of archives, sharing
> economies, and self-made media throughout queer history. [46]

Thus, the RCMA has three main goals, 1) to educate – providing videography workshops, and

sharing technologies and videotapes, 2) to archive – "uncovering" stories and "self-made media"

and 3) to build community by "connect[ing] with LGBTQ+ populations" throughout Mid-

America. More specifically and practically, the RCMA consists of a large GMC Safari Van

modified to fit custom-built, folding VHS shelving units and videography equipment, which can

be unloaded and displayed as a pop-up, makeshift library, archive and media center. To date, the

RCMA has held one major public event, which I will explore in the last section of this paper.

First, to understand the evolution of this project and its place within a larger historical context of

collecting and queer archives, one must return to its roots in Harbin's prior project, the *Cry Now

Free Video Library*.

In this section, to lay the groundwork for a discussion of "critical nostalgia," I will offer a

brief history of the origin of the RCMA and its roots in Harbin's prior project, the *Cry Now Free

Video Library*. In late 2016, Harbin converted her small bedroom into a fully operational VHS

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[46] Kendell Harbin, "ABOUT," *RCMA*, accessed March 23, 2018. https://www.roamingcenter.org/about/.

rental library. She lined her walls with shelving and built a large, chest-high counter across the entire length of her room. She installed display lighting, pegboard wall mounts, and vinyl letter signage. She strung together four old televisions and hooked them up to her VCR. She placed a hand painted sign in her second-floor window, and on Christmas Day, 2016, *The Cry Now Free Video Library* opened to the public. Located in a large communal house with an open-door policy, visitors were welcome to rent from the collection of VHS tapes completely free of charge, on an honor-based system. With custom designed plastic clamshell cases, and all the trappings of a mid-90's independent video rental store, word quickly spread within the Kansas City artist community[47]. As more people flowed through the space, hundreds of new tapes were donated and added to the collection. A collection that began as mostly a standard set of commercial Hollywood releases from the late 1980s to the early 2000s, slowly expanded to include more home videos, pornography, and rare, obscure videotapes. Through the opening-up of the space, a "collective collection" began to emerge.

Before one can understand the larger intention behind the RCMA project, a deeper understanding of Harbin's videotape collecting practices is necessary. Harbin expresses that despite owning a rather large collection of movies (she guesses roughly 2000), her interest was never quite the same as that of the typical "fan" or a cult film collector. As she explains, "I have bad taste in movies. What I have is an addictive personality that ran rampant when I finally had the space to collect as many videos as I wanted."[48] While the "addiction" Harbin expresses is a common trope within the burgeoning field of collection studies, unlike most of the collectors

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[47] ArtsKC. "Cry Now Free Video Library – ArtsKC," accessed March 21, 2018. https://artskc.org/cry-now-free-video-library/.

[48] Kendell Harbin, interviewed by Asa Wilder, telephone, March 18, 2018.

featured in the popular ethnographies by Bartok and Joseph[49] or Kim Bjarkman,[50] for Harbin, the value of each individual tape is of little importance. She explains, "an individual tape means nothing to me." Rather, her project, from its very early stages, was about the cultivation and formation of the space around the tapes, the social relations the tapes might foster and the affective resonance of the collection itself. Again, she explains, "I don't think the VHS era, as a format is superior or great…I mostly just like that it forced people to occupy space together."[51] Here, Harbin expresses one of the key qualities of a collector, as described by Benjamin: a collector has "a relationship to objects which does not emphasize their functional, utilitarian value—that is, their usefulness, but studies and loves them as the scene, the stage, of their fate."[52] For Harbin, the "scene" of the videotape library is more important than the moving image content contained on the tapes.

While *Cry Now* still served the practical purpose of providing free take-home entertainment to its patrons, the deeper purpose was the impact of the library as a scene, or a space. In *On Longing* Susan Stewart claims "the collection represents the total aestheticization of use value."[53] In the example of *Cry Now*, the tapes, by becoming part of the collection, are transformed and aestheticized. Within this new context, the aesthetic of the collection, as a whole, overpowers the function of each individual tape. As Stewart explains, "the collection is a form of art as play, a form involving the reframing of objects within a world of attention and manipulation of context. Like other forms of art, its function is not the restoration of context of origin but rather the

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[49] Dennis Bartok and Jeff Joseph, *A Thousand Cuts: The Bizarre Underground World of Collectors and Dealers Who Saved the Movies*, 1 edition (Jackson: University Press of Mississippi, 2016).
[50] Kim Bjarkman, "To Have and to Hold: The Video Collector's Relationship with an Ethereal Medium," *Television & New Media* 5, no. 3 (August 1, 2004): 217–46, https://doi.org/10.1177/1527476403254000.
[51] Harbin, telephone interview, March 18, 2018.
[52] Walter Benjamin and Hannah Arendt, *Illuminations: Esssays and Reflections* (Doubleday, 2012), 60.
[53] Susan Stewart, *On Longing: Narratives of the Miniature, the Gigantic, the Souvenir, the Collection*, 1st paperback ed (Durham: Duke University Press, 1993), 151.

creation of a new context, a context standing in a metaphorical, rather than a contiguous, relation to the world of everyday life."[54] If the *Cry Now* collection presented a metaphorical relation to the world, what did that metaphor say? We can answer first by noting that the metaphor relied on the nostalgic representation of a mythical video rental store. In an exhaustive study of the history of commercial videotapes, Media Historian Joshua Greenberg articulates how video stores, despite their commercial, transactional purpose, often served a more meaningful social function as well. He describes the independent video store of the 90s as a "unique type of consumption junction—one where social interactions were at least part of the attraction for customers," and he goes on to explain that "this social space can take on added layers of meaning and importance. Just as the users of a technology may create alternate uses and meanings for a given artifact, the inhabitants of a consumption junction are able to use it for other purposes in addition to simple consumption."[55] *Cry Now* obviously sought to refence this history in its aesthetic, and thus to mirror the lost social, community building function of the video rental store in practice. Harbin explains this phenomenon on her website: "it is in this somewhat anachronistic setting where an odd sort of currency emerges; both people and media circulate according to chance and desire, rather than industry trends or conventional standards of organization."[56] Harbin's organizational structure for the tapes also helped cultivate this free-flowing, serendipitous exchange of objects and people. Movies were grouped in sections such as "Iconic White Dudes," "Monsters, Zombies and Dead People" or "Femmes Shaving Their Heads." There was a funny unpredictability, and an odd logic to the flow of items, but more importantly, the descriptive

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[54] Stewart, 152.
[55] Joshua M. Greenberg, *From BetaMax to Blockbuster: Video Stores and the Invention of Movies on Video* (MIT Press, 2010), 114.
[56] Harbin, "ABOUT," *RCMA,* accessed March 23, 2018, www.roamingcenter.org/about.

categories helped create a sense of community and offered an invitation to the visitor based on a personal ethic of care for the collection.

As her project evolved, Harbin explains, she began seeking a deeper personal connection to the video material and to the identity of a community mediated through it. The practice of building and expressing identity through collecting lead Harbin to certain questions about the items in her surroundings: "What did it look like to be gay in the 90's, living within the margins of the margins, far removed from the coastal spotlight and unconcerned with the hype of major metropolitan cities? As a queer and gender nonconforming person living in Kansas City, I wanted to connect with others exploring this vast invisible network."[57] To answer this set of questions, Harbin knew she would have to expand beyond her bedroom walls, to reach out into the unknown spaces where the material remnants of that history lay hidden. In short, she needed to go mobile. In a recent interview, Harbin recounts an important and influential conversation, in which she expressed to a friend her inexplicable desire to take her collection on tour, to which her friend replied, "you are a lonely queer person and you wanna tour cause you wanna meet people, and that's what this is all about, duh."[58] Harbin took this comment as revelatory and it helped in conceptualizing her larger project. Here, the role of building community is a clear motivation in the formation of the larger archival project. Hence, Harbin designed a way to connect a disconnected present-day community (rural queer youth in the Midwest) through an imagined, as-yet unknown material history (the videotape documentation of queer life in the pre-digital media era).

The RCMA falls within a diverse and connected set of traditions within archival practice, art, librarianship and collecting in general. Harbin was able to secure funding for her project through

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[57] Ibid.
[58] Harbin, telephone interview, March 15, 2018.

an appeal to various arts organizations around the United States, including the Mid-America Arts

Alliance, the National Endowment for The Arts, The Andy Warhol Foundation, and The

Gallucci Creative Fund. The RCMA is part of a larger trend of increasing overlap between

archival and artistic practice. In a chapter summarizing the merging of these two worlds,

Gabriella Giannachi argues that "since the time of the Second World War, an increasing number

of artists have used a whole variety of archival methods to curate, store, exhibit, and even sell

their works" and states that many artists "have produced archives as part of their creative

practice."[59] As a part of this tradition, within the context of the art world, the RCMA is able to

shed the "neutral" and "objective" demands of many larger, institutional moving image archives.

As the work of an artist, the RCMA is imbued with a creative spirit and energy, and thus the

collected materials are liberated from their static role as mere "evidence." Collecting as an

artform has a long history dating back to ancient times and evolving up through the wildly

creative craftwork of early modern cabinets of curiosity. As collecting practices have evolved

with the invention of archival science, library science and museology, artists have adapted these

strategies to serve their projects, as well. The artistic power of the RCMA stems from its ability

to recontextualize and re-present the material it collects for a present-day observer, and likewise,

the archival power of the RCMA stems from its ability to make documentary and historical

materials accessible and available within the present.

   In addition to the tradition of archives as art, the RCMA builds on a rapidly growing

engagement with the concept of "queer archives." While "queer archives" certainly refers to

community archives that collect LGBTQIA+ materials, like the ONE Archive at the University

of Southern California or the Lesbian Herstory Archive in New York City, in recent years,

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[59] Gabriella Giannachi, *Archive Everything: Mapping the Everyday* (Cambridge, Massachusetts: The MIT Press, 2016), 132-3.

cultural theorists have begun to broaden the concept to expand beyond the relatively scarce

collected body of explicitly queer material culture. As Ann Cvetkovich explains, "a useful

archive, especially an archive of sexuality and gay and lesbian life, … must preserve and

produce not just knowledge but feeling. Lesbian and gay history demands a radical archive of

emotion in order to document intimacy, sexuality, love, and activism, all areas of experience that

are difficult to chronicle through the materials of a traditional archive."[60] The RCMA, seeks to

create this "radical archive of emotion" in multiple ways: first, Harbin's digitization process is a

deeply personal and emotional experience. Rather than simply taking custody of a tape,

transferring its contents in private, and delivering the tape back to its owner (like most

digitization operations), Harbin sits down with the tape's owner (or the chosen contributor)[61] and

watches the entirety of the tape, as the transfer occurs. Moreover, Harbin asks the contributor to

record a voiceover narration while watching the playback of the tape. As will become clear in a

later example, this can often have profoundly affective and emotional relevance. Cvetkovich also

states that queer archives "assert the role of memory and affect in compensating for institutional

neglect."[62] The RCMA in its various instantiations, is radically dedicated to showing the power

of memory and affect.

Additionally, Harbin's position outside of traditional archives and institutions is a powerful

part of the RCMA's ability to express a queer experience. Judith (now Jack) Halberstam (2003)

explains, "the [queer] archive is not simply a repository; it is also a theory of cultural relevance,

a construction of collective memory and a complex record of queer activity. In order for the

archive to function, it requires users, interpreters, cultural historians to wade through the material

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[60] Ann Cvetkovich, "In the Archives of Lesbian Feelings: Documentary and Popular Culture," *Camera Obscura* 17, no. 1 (February 1, 2002): 1–147, 109.
[61] Promotional material states "Bring your tape(s) and any person(s) with knowledge about the footage."
[62] Cvetkovich, "In the Archives of Lesbian Feelings," 109.

and piece together the jigsaw puzzle of queer history in the making."[63] This "theory of cultural

relevance" can appear in many different forms and can be collected in various ways. For the

RCMA, creating a platform to explore the link between magnetic media and queer history

identifies a missing piece to the "jigsaw puzzle of queer history." Moreover, the "bottom-up" or

DIY nature of the RCMA means that it is an especially powerful site of community investment

and affective relations. Or, as Sarah Baker explains, "DIY archives and museums can be thought

of as places in which affect is produced and made possible through community and the process

of remembering, and made again through encounters with objects [and people] that inspire both

these things."[64] Thus, unlike a major institutional or traditional archive, the RCMA, as a queer,

DIY archive is positioned especially well to serve as a site of affective resonance and collective

remembering.

 Moreover, Harbin's commitment to collecting videotape, a technologically obsolete media

format, lays bare the ways in which archives and thus historiography, are shaped by the methods

and materials used in the transmission of information. But more than that, it shows the ways in

which identity itself is shaped by the available technologies of representation and documentation.

In other words, she shows that the invention and widespread availability of home video

recording technology did not lead to the formation of queer communities, but rather, it allowed

for a more widespread visibility of a media-marginalized, and "under-documented" existent

community, which, in turn, began to shape that community's identity. And while the community,

the people, may have been present long before videotape (or film, or printing), much of today's

"queer identity," and certainly the mainstream perception of queer people as a community, is tied

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[63] Judith Halberstam, "What's That Smell? Queer Temporalities and Subcultural Lives," *International Journal of Cultural Studies* 6, no. 3 (2003): 313–333, 326.
[64] Sarah Baker, *Preserving Popular Music Heritage: Do-It-Yourself, Do-It-Together* (Routledge, 2015), 48.

to the rise of this increased visibility. As Harbin explains, the RCMA is "about piecing together an immediate history of 'queer identity', which is something—that phrase "queer identity", is a very new concept – 'cause for a long time you weren't allowed to claim an identity that revolved around being queer. And that changed with home videos."[65] Harbin sees a major link between the formation of queer identity and the rise of videotape technologies.

By highlighting the importance of the videotape format, the RCMA also points to the period prior to the arrival of videotape, and to the relative scarcity of queer experience reflected on celluloid film. In "Collective Effort: Archiving LGBT Moving Images" Lynne Kirste contests that "since mainstream cinema and television have consistently marginalized LGBT people, a large percentage of all queer moving images are found in independent and amateur works."[66] And because videotape drastically decreased the economic and technical barriers to produce independent and amateur works, obviously, one can reason that a large percentage of all pre-digital queer-related moving images are found on videotape. As the thousands of hours of queer related video on youtube can attest, the availability of the means of documentation heavily shapes what types of lives, identities and feelings will be reflected in those documents. Cifor (2017) makes this same point in relation to the creation of video records of the ACT UP movement in the early 1990's: "Shifts in video technology opened new and broader possibilities for who and what was being documented."[67] Furthermore, the availability of those new documents then helps to shape the community who views the documents. This cyclical process of media creation and representation is a major aspect of Harbin's project.

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[65] Harbin, telephone interview, March 15, 2018.
[66] Lynne Kirste, "Collective Effort: Archiving LGBT Moving Images," *Cinema Journal* 46, no. 3 (2007): 134–140, 135.
[67] Cifor, "'Your Nostalgia Is Killing Me,'" 66.

The collection of moving image and video materials has a unique role in the preservation of historical memory, in general. In their 2004 study of videotape collectors, Kim Bjarkman argues that "while museums turn history into spectacle, video archives turn spectacle into history…video collecting is an act of cultural curating—a system for containing the past to recover and revivify it."[68] While Bjarkman is particularly concerned with television video collectors, the same argument may be applied to amateur and home video collections of marginalized communities. By containing the history of queer life and feeling in video, collectors are able recover and revivify those feelings in the present. Video, perhaps more than any other medium, is an attempt to collect and store the passage of time itself. Further, the origin of videotape and magnetic media, is rooted not in making moving image films more commercially available, but rather in the act of "time-shifting" television. A brief look at the early history of VHS (or Betamax) shows that, years before Hollywood productions were released on videotape, the format was used and marketed primarily as a "time-shifting" device for television broadcast.[69] While Harbin is not directly concerned with this history of the format, the overlap of its original purpose with her current uses for videotape, cannot be ignored.

This connection between video and time leads to the final and most vital aspect of the RCMA: nostalgia. Both the faux early-90's video store presented in Cry Now and the wandering quest for queer-related videotape of the RCMA clearly express a nostalgic longing for the past captured or expressed in those tapes. In *The Future of Nostalgia*, Svetlana Boym points to some of the negative, anti-social aspects of nostalgia: "Nostalgia is a sentiment of loss and displacement, but it is also a romance with one's own fantasy…Nostalgia in this sense is an abdication of personal responsibility, a guilt-free homecoming, an ethical and aesthetic failure."

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[68] Bjarkman, "To Have and to Hold," 235.
[69] Michael Z. Newman, *Video Revolutions: On the History of a Medium* (Columbia University Press, 2014).

[70] But unlike this more traditional, backwards-oriented nostalgia of other types of collecting, the RCMA critically engages and challenges a vision of the past to reshape the consideration of that history in the present. By uncovering and repurposing the video of this longed for past the RCMA is focused on creating community in the present. But, if as Halberstam argues, "quests for community are always nostalgic attempts to return to some fantasized moment of union and unity,"[71] what makes the RCMA's nostalgia and more "critical" than say the nostalgia of 80's VHS Horror Tape collectors or the recent trend of television series reboots? Cifor suggests that critical nostalgia "emphasizes the value of a temporal relation of longing for past times and spaces while also remaining attentive to the dangers, ambivalences, and complexities of that past" and that it is "a mode of critique focused on a past that inserts itself continually into the present with critical implications for the future."[72] Applying these definitions, we can see how RCMA's focus on the materiality of videotape and the affect and emotion contained within, engages with the complexities and ambivalences of that past. In the act of collectively watching and recording a voiceover for these documents of sometimes painful traumatic experiences, participants allow the past to "insert itself into the present." Moreover, by placing an immediate value on an outdated, obsolete medium, the RCMA offers a "queer temporality" that challenges a tradition, linear conception of progress and time, and allows its participants "to believe that their futures can be imagined according to logics that lie outside of the conventional forward-moving narratives of birth, marriage, reproduction and death."[73]

Both video and nostalgia play an important role in the way history is preserved, perceived and experienced. They are both an attempt to hold onto an experience in the face of the passage

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[70] Svetlana Boym, *The Future of Nostalgia* (Basic Books, 2008), xiv.
[71] Halberstam, "What's That Smell?" 315.
[72] Cifor, "'Your Nostalgia Is Killing Me,'" 264, 263.
[73] Halberstam, "What's That Smell?" 314.

of time. In "Video Remains: Nostalgia, Technology, and Queer Archive Activism," Alexandra

Juhasz explores the relationship between nostalgia and video as it relates to the Queer Archive.

Juhasz describes her experimental documentary of the same name, *Video Remains (55 mins.,*

2005), in which a group of four lesbian video activists narrate over an interview of their friend,

James Robert Lamb, recorded in 1992, a year before he died of AIDS. Juhasz explains, "we

watch and listen to Jim in 1992 mixed with today's characters caught in 2004. The intrusion of

present-day AIDS…enlivens my old tape and recommits to a contemporary conversation about

AIDS, its representations, feelings, activism, and history."[74] While the RCMA has not yet dealt

with this level of traumatic experience, one can see how the same logic may be applied. How are

the found home videos in the RCMA "enlivened" by the context of a queer DIY artist-archive in

the present-day Midwest, and how is a present-day queer Midwest community affected by the

collective watching of these tapes? Juhsaz argues that video can play a unique role in the

preservation and creation of memory: "Video is collective and objective in that it is unchanging

while also being a mutually verifiable record of things that once were, are no longer, but remain

present through the form of its mechanical reproduction. Video is what is left over of what

visibly and audibly was in space and time."[75] While certainly one could challenge the assertion

that video is objective and unchanging, nevertheless, its ability to document affect and feeling is

especially valuable and perhaps unique among media. Returning to Ann Cvetkovch's

conception of an "archive of feeling," the vital link between nostalgia and video might be

expressed as their shared ability to temporally link affects or feelings. Thus, film and video play

a major role in Cvetkovich's conception of the archive as expressed in her work on this subject,

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[74] Alexandra Juhasz, "Video Remains: Nostalgia, Technology, and Queer Archive Activism," *GLQ: A Journal of Lesbian and Gay Studies* 12, no. 2 (2006): 319–328.
[75] Juhasz., 323

"In the Archives of Lesbian Feelings: Documentary and Popular Culture." Finally, Juhasz asks "What if the nostalgic romance is not with a fantasy? What if the past is videotaped and so you can prove that it was there? What does video do to or with nostalgia?"[76] And to this question, the RCMA answers: video turns nostalgia into critical nostalgia and more specifically, video*tape* turns nostalgia into a critical nostalgia grounded in the materiality of a present-day community.

In this final section I will look at a recent RCMA event, and a video digitization project to highlight how these projects reflect the potential value of critical nostalgia. The RCMA's first official public event was a week-long residency at Open House "an experimental and collaborative neighborhood arts project located inside a single-family house in Kansas City."[77] Harbin states that when she first saw the space, she immediately knew it was perfect for the RCMA. The domestic space, and the home are an essential part of both of Harbin's projects to date. As Cifor also explains, the home offers a powerful framing device for archival practice: "Home is a lens that offers productive and affective ethical orientations grounded in a feminist ethics of care towards records creators, records subjects, and larger communities implicated in the archives and its records to both archivists and activists."[78] Harbin's use of the home as archive clearly utilized some of this same thinking. Converting the home into a temporary VHS library and media center, Harbin held daily open hours and publicized her free videotape digitization services both online and to the surrounding community. The week culminated in a public event, titled *Boundaries*, at which seven local artists and writers "read to a silent screening of early 90's television recordings found on tape in one Woman's basement."[79] These tapes had been donated to the RCMA a few months earlier, and consisted of about 400 meticulously

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[76] Juhasz, 323.
[77] "About," *Open House Space*, accessed March 18, 2018, http://openhouse.space/about.
[78] Cifor, "'Your Nostalgia Is Killing Me'" 94.
[79] "The RCMA," *Open House Space*, accessed March 18, 2018, http://openhouse.space/thercma.

labeled and organized 8-hr VHS recordings of early 90's television. Reaching out to local writers and artists, Harbin spent roughly a month processing the collection and watching many of the tapes, with potential collaborators. Harbin was unaware of (and mostly uninterested in) the exact programs on the tapes, rather, she asked her collaborators to tap into the affect, and the emotional weight of the images, in order to imagine a new audio track that would resonate within the community in the present. While video documentation of the event is not yet available, I spoke to several attendees who were deeply emotionally moved by the night's performances. A public screening of found 25-year-old videotapes of recorded cable television is not necessarily a "critical" act, but through the affective and collective power of the queer archive, this cast-off refuse was transformed into a site of communal power and identity formation.

Harbin's collaborative digitization process utilizes this same critical nostalgia to preserve endangered historical LGBTQ-related material, while creating a new document of collective memory for the present-day Mid-western queer community. Utilizing the popular technique of audio commentary tracks as seen in recent DVD, Blu-ray and streaming cinema packages, Harbin invites all contributors to record their reactions while watching their home videos or other submissions. In one such case, recorded during the RCMA's week-long residency at the Open House space, one person, had a moving experience while watching, and digitizing a home video of their teenage years in the mid-1990s. As Harbin explains:

> I basically watched her go through puberty and graduate and turn 18 and leave…It was super cool…and I don't think she knew what she was getting into and neither did I and we ended up watching two hours of home video of her and at the end of it she said, 'well since you basically just watched me go through puberty, do want to hang out? Or like get coffee sometime?' I knew all this stuff about her life but she didn't know anything about me…

> …I remember this one shot of her at her graduation and she was hugging this
> fence and she said 'oh that's so-and-so, she was my best friend, but looking back
> at it now, I realize I was just in love with her'[80]

Here, Harbin offers a stark example of the way critical nostalgia can function to build new bonds, new collective memories and new futures. Through the nostalgic act of watching old home videos on outdated equipment, the RCMA activates those memories in service of the queer experience in the present-day. A home video of an 18-year-old at their high school graduation typically has little evidentiary, monetary, or historical value for the larger society, but by placing it within the context of a queer DIY archive, the affective power is transferred into the present day. As an "archive of feeling" the RCMA offers a way to recover the potentiality locked in community's material history.

Both the Cry Now Library and the RCMA offer a creative and promising vision of the social power of collecting. Without becoming lost in the solipsism of melancholia or embracing the sometimes regressive politics of nostalgia, these projects engage in a longing for the past that is both affective (building community bonds) and effective (preserving material that would otherwise be lost). Building on a growing tradition of archival art, queer archives and moving image archives, Harbin's critical nostalgia offers a "philology of the material world," that highlights the immanent potentiality of the present moment.

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[80] Harbin, telephone interview, March 15, 2018.

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Core Course Paper
Universal Classification Standards and Indigenous Knowledge

Written for *IS-212: Values and Communities in Information Professions* with Prof. Ramesh Srinivasan, Spring 2018

For the final assignment in this course, we were tasked with writing a persuasive essay that incorporated at least four of the assigned readings from throughout the quarter. Having spent years working in libraries helping patrons navigate the Library of Congress Classification and Dewey Decimal Classification systems, I was especially excited to read the oft-cited critiques of these systems by Hope Olsen and Emily Drabinski. For the final paper, I decided to build on these critiques by investigating the viability of alternative classification systems. More specifically, I brought in a discussion of the Brian Deer system, rooted in Indigenous ways of knowing, as a case-study for how these alternative systems might be designed and implemented. By incorporating Prof. Srinivasan's work on community-based, collaborative design, I attempt to outline how these alternative classification systems might be developed and supported by LIS professionals. This paper reflects my background in library work and the development of a more critical and ethical lens on the basic mechanisms of classification.

<u>Universal Classification Standards and Indigenous Knowledge</u>

In this paper, I examine library classification systems and argue that librarians working in marginalized communities should adopt community-based, collaborative methods to design alternatives to the dominant classification systems. More specifically, I suggest that by theorizing and developing alternatives to Dewey Decimal Classification and Library of Congress Classification, Library and Information Studies (LIS) workers can better serve Indigenous and other marginalized communities. Additionally, I stress the pedagogical value of direct community engagement with these traditionally taken-for-granted systems. Through an examination of the challenges, limits and potentialities of such a project, I attempt to lay the theoretical foundation for collaborative, community-based classification system design. After outlining the fundamental problems lying at the heart of DDC and LCC, I will examine a successful example of an alternative classification scheme: A. Brian Deer's system of classification rooted in Indigenous ways of knowing. I will then turn to case studies of collaborative, community-based technology design in other contexts to argue that similar approaches could be adopted in library classification processes. Finally, I will address the many limitations, challenges and implications of such an approach toward library classification schemas.

Classification allows us to develop standards that organize our knowledge into manageable and navigable parts. By creating standard naming practices, we are able to sort chaotic streams of information into fixed, stable categories. As these categories become more widely accepted and deeply entrenched, they also tend to recede from view, appearing as universal and neutral parts of the environment. The more widely accepted a standard becomes, the harder it is to notice the inner-workings of the system that created it. Beyond dictating the spatial location of materials, and structuring the organization of a library's physical space, library classification systems also articulate a specific way of organizing knowledge and understanding the world. Lying at the very core of the library and information studies (LIS) profession, classification and cataloguing systems have always played a vital role in the way knowledge is sought and retrieved by library users. Thus, all library workers, whether they are involved in the cataloguing process or not, should be aware of the way these systems structure library space and the interactions within it. One way they can do this is through direct critical engagement with the

most popular and widely used library classification and cataloging systems: the Library of Congress Classification (LCC), Library of Congress Subject Headings (LCSH) and Dewey Decimal Classification (DDC).

Over the last 40 years, a growing body of literature within LIS has developed around critiquing these systems. By exploring the limitations, biases and failures of LCC and DDC, LIS scholars have begun to unpack the ways these classification systems entrench existing power structures and further marginalize already disempowered voices in the library. In "The Power to Name: Representation in Library Catalogs" information studies scholar Hope Olson systematically shows the ways both DDC and LCSH are built around "presumptions of universality" that end up making information about non-mainstream subjects harder to find. While influential librarians such as Sanford Berman had critiqued these systems by pointing out the biases and errors in naming practices, Olson goes a step further to challenge LCSH and DDC at their very core.

The fundamental problem with both LCSH and DDC, as Olson sees it, is two-fold: 1) the drive to reduce the complexity and subjectivity of names to a single universal controlled vocabulary and 2) the imposition of linear, top-down hierarchical relationships between concepts. Regarding the first issue, language standardization, Olson argues that "in imposing controlled vocabulary we construct both a limited system for the representation of information and a universality/diversity binary opposition." [81] This binary opposition means that in order to create a system that is universally applicable (as both Melvil Dewey and Charles Cutter intended) the ability to fully represent diversity must be sacrificed. In other words, by appealing to some universal and standard application of names, these systems erase more nuanced difference and diversity. For instance, while there may be hundreds of ways to express a complex identity-category like sexuality, controlled vocabularies such as the LCSH insist on limiting this fluid, ever-evolving language to a fixed, standard set of terms. Within LCSH, terms may be added or removed, but nevertheless the efficiency of the classification system itself is reliant on minimizing the different ways to express subjects. Olson shows how this erasure of difference is inherent and necessary to the project of standardization.

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[81] Olson, Hope A. "The Power to Name: Representation in Library Catalogs." *Signs* 26, no. 3 (2001): 639-68. http://www.jstor.org/stable/3175535.

Regarding the second major issue, these systems' hierarchical structure, Olson uses the example of DDC's instruction for the classification of social groups to show how biases are manifested. By ordering the ways in which social groups are indexed together, the DDC creates a "hierarchy of oppressions" which results in material related to some groups always being gathered together while material related to other groups is dispersed throughout the collection. Working through this example, she shows how "material focusing on black youth cannot…be classified with material on black people in general[82]." The implications of this structure are clear: the rigid rules for the groupings of certain material means that some subjects will be quite easy to access and to browse, while others will require immense work for the library patron. Like DDC, Library of Congress Classification (LCC) also exhibits bias through its structural hierarchy. For example, LCC locates materials about transsexuality under the classification of *sexual and psychosexual conditions*, which "suggests that transsexuality is a psychological disorder that can be remedied with treatment, rather than just another way of existing in a gendered world."[83] Moreover, this classification "ghettoizes" the vast array of subjects and issues related to "transsexuality" into the section dealing with medical and psychological disorders – a non-obvious place to look for people who do not share this misconception. The problem here is both practical (information is harder to find) and ideological (the classification expresses a biased and problematic world-view). Olson's argument shows how these differences in accessibility are built into the nature of both LCC and DDC.

Furthermore, by closely examining the foundational documents of these systems, Olson identifies that both were developed to ease information access and retrieval for an assumed generalized, ideal, rational "public." This means that LCSH and DDC were designed not to accommodate for multiple ways of knowing, but to meet the needs of users with a "unified perspective and a single way of seeking information."[84] For Olson, LCC and DDC are not simply problematic because they express some bias, as all classification systems must, but rather, that they unfairly harm and erase people outside the "mainstream" power structures for which these systems were designed. Cataloguing and universal standardization necessitates the erasure and

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[82] Ibid, 655

[83] Drabinski, Emily. "Queering the Catalog: Queer Theory and the Politics of Correction." *The Library Quarterly: Information, Community, Policy* 83, no. 2 (2013): 94-111. doi:10.1086/669547.

[84] Olson, "Power to Name," 642.

obfuscation of difference, and this negatively effects members of social groups not in power. She argues that "the fundamental presumption on which our practice rests disproportionately affects access to information outside of the cultural mainstream and about groups marginalized in our society" [85] In other words, because these systems are driven by the desire to appeal to the most amount of people simultaneously, they obscure information about the least popular or sought-out topics and they ignore other ways of organizing knowledge. These marginalizing biases are then learned by library users who interact with these systems seeking materials.

The biases in these systems are not merely technical problems that make non-mainstream material harder to find, they also teach these biases to library users, imposing a hegemonic worldview rooted in racist, settler-colonial, late 19th century assumptions. As librarian and critical cataloguer Emily Drabinksi explains, "as users interact with these structures to browse and retrieve materials, they inevitably learn negative stereotypes about race, gender, class, and other social identities.[86]" Examples of these stereotypes and assumptions abound in both DDC and LCC and have been documented extensively within LIS literature. Perhaps most famously, DDC's classification of religion is extremely skewed towards favoring Christianity: while the entirety of the 200's are devoted to religion, issues related to Chrisitianity take up the entire 200-289 range and all non-Christian religions are classified within the 290s alone.[87] My goal here is not to prove or fully analyze the many problematic qualities and biases of these dominant systems, but rather to express where and how alternatives might emerge.

In "Queering the Catalog: Queer Theory and the Politics of Correction," Drabinski offers a new approach to the issues identified by Olson. Building on a Foucaltian conception of knowledge as discoursively produced, Drabinski challenges the way librarians and catalogers have attempted to "correct" the biases of LCSH and DCC. She argues that the critical cataloging movement in LIS has "addressed the problem of bias in these structures primarily as a functional problem: materials are cataloged incorrectly, and they can be cataloged correctly with the correct pressure."[88] Her argument, building out of Olson's critique, suggests that rather than applying pressure to correct the biases and inaccuracies of these systems, librarians should "leave intact the traces of historicity and ideology that mar the classification and cataloging project." And in

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[85] Ibid, 640
[86] Drabinski, "Politics of Correction," 97
[87] https://www.oclc.org/en/dewey/features/summaries.html
[88] Drabinski, "Politics of Correction," 95

this way, classification and cataloging schemes can become a site of collaborative learning and dialogue between public-facing library workers and library users. Through the lens of queer theory, she suggests that these practices point to "a project of dialogic pedagogical interventions that push all users to consider how the organization of, and access to, knowledge is politically and socially produced.[89]" So, rather than clinging to the project of modifying the limits of standard classification systems, Drabinski suggests librarians should foreground those limits to spark a greater understanding of the way these systems function.

While Drabinski's proposed "critical interventions" offer valuable tools for library workers in mainstream, large institutions, they do not address the needs of communities with smaller, highly specialized collections. For example, a librarian/cataloger at a small library dedicated to the study of Eastern religions would most likely need an alternative system to DDC in order to more accurately express the range of materials in the collection. Even more pressing, both Olson and Drabinski fail to offer any solutions for indigenous communities that exhibit radically distinct ways of knowing that are fundamentally incompatible with DDC and wholly ignored by LCSH (as will be discussed). Every library classification system reflects a specific subjective worldview. As both DDC and LCC systems grew out of the same general epistemological and cultural assumptions, (late 19th century American White Cis-gendered Hetero colonialist and male) they tend to reflect very similar and overlapping worldviews. Both are built out of rationalist, universalizing assumptions that obscure diversity. They both value universality, convenience and standardization above flexibility, specialization and specificity. So, why are these systems still so pervasive and prevalent? Why, walking into almost any public library in the United States, will you see material organized in roughly the same way? Obviously, there are huge benefits to the interoperability of library classification systems and I will return to those issues later, but for now I wish to stress the value of questioning these systems at their core.

The fact that these dominant systems are biased against women, people of color, indigenous people and other marginalized identities is more than just an issue of information organization and design; it reflects the deeper power imbalances in the way these systems were built and then spread into libraries worldwide. For, as Srinivasan suggests, "classification systems tend to reflect the biases and ontologies of those with the power and privilege to design

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[89] Ibid, 101

and circulate such systems."[90] It is clear then that we must not only change how these systems function and how we can work within them, but we also must imagine and work towards creating radically new ways to "design and circulate" such systems. In other words, if LIS workers are serious about creating more equitable and fair classification systems for library materials, then the solution necessitates shifting who has the "power and privilege" to build these systems in the first place. Beyond shifting responsibility to the reference or user-services librarian to critically engage with these systems, we must allow other ways of knowing and organizing knowledge to gain voice. Rather than viewing LCC and DDC as fundamentally neutral, essential parts of our profession, we should view these systems as the dated, marginalizing, and homogenizing forces that they are. By shifting the perception of these systems, perhaps a more generative and creative process of classification system design can emerge that would better serve those communities most marginalized by DDC and LCC.

While the problems and biases of mainstream cataloging and classification systems have been extensively documented and debated within LIS, the practical solutions to these issues are less clear. Both Drabinski and Olson offer valuable suggestions for how digital technologies and other tools can be utilized to augment, adapt and otherwise intervene in catalog record retrieval and organization. More specifically, Olson suggests that librarians should "apply technology in innovative and subversive ways, to stretch standards such as LCSH and DDC."[91] With the rise of technologies like MARC records and Online Public Access Catalogues (OPACS), catalog records and the systems for retrieving them have become much more flexible. In one example, Olson shows how the misogynist biases of DCC can be offset by "map[ping] the feminist vocabulary, *A Women's Thesaurus* (1987) to DDC (1996) using an electronic interface designed by Dennis Ward."[92] Further, she suggests "designing search interfaces that make related and broader terms visible to users so that they can understand how materials are linked in the knowledge organization scheme."[93] These types of digital interventions can certainly aid in correcting the biases of DDC, but as Drabinski points out, those kinds of corrective measures may in fact simply further legitimate the project of building universal knowledge organization

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[90] Srinivasan, Ramesh. *Whose Global Village?: Rethinking How Technology Shapes Our World*. (NYU Press, 2017), 131.

[91] Olson, "Power to Name," 659.
[92] Ibid, 661.
[93] Drabinski, "Politics of Correction," 106.

systems. Thus, I will now turn to an example of an "indigenized" "knowledge organization system" to argue that we must rethink the entire methodology behind the way we interact with our library classification systems.

The immense potential of alternative library classification system design is evident in the example of Brian Deer Classification (BDC). Developed by Kahnawake Mohawk librarian A. Brian Deer in the early 1970's, this system was designed to meet the specific needs and match the interests of the library of the National Indian Brotherhood (NIB), a "national Indigenous political organization representing Aboriginal interests, rights and title."[94] Over a period of two years, Deer developed and tweaked this system, which, rooted in indigenous ways of knowing, forgoes an appeal to universality, and grows directly from the nature of the collection itself. The BDC does not simply offer a correction of DDC of LLC, but rather expresses the organization of knowledge in a fundamentally different way. In opposition to Dewey and Cutter, Brian Deer's design reflects "Indigenous values and perspectives" and "is not discipline-based but designed for action." [95]

However, because BDC is developed out of a more place-based and localized way of knowing, it is not easily transferable between libraries. Nevertheless, a number of institutions throughout Canada have adopted "variations and iterations" of BDC. Annie Bosum and Ashley Dunne, librarians at the Aanischaaukamikw Cree Cultural Institute describe why they chose to implement BDC at their institution:

> We determined that because our collection is focused on the Cree of Eeyou Istchee and includes many books on other nations in North America, Dewey Decimal Classification (DDC) or Library of Congress Classification (LCC) would not adequately organize our collection. Along with the use of outdated language, the organization of information in DDC and LCC springs from a non-Indigenous perspective that does not fully capture the finer classification potential of the majority of the books in our collection. Both systems would place nearly all of our collection into the History section, organized by national and provincial borders (in

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[94] Bosum, Annie, and Ashley Dunne. "Implementing the Brian Deer Classification Scheme for Aanischaaukamikw Cree Cultural Institute." *Collection Management* 42, no. 3–4 (October 2, 2017): 280–93. https://doi.org/10.1080/01462679.2017.1340858.

[95] Doyle, Ann M., Kimberley Lawson, and Sarah Dupont. "Indigenization of Knowledge Organization at the Xwi7xwa Library." University of British Columbia, 2015. https://doi.org/10.14288/1.0103204.

the case of DDC) or by a Western timeline (in the case of LCC). With both DDC and LCC, specific aspects of Indigenous history, customs, and culture become homogenized under generic subheadings and long strings of numbers.[96]

Here, the clear biases and inadequacies of both DDC and LCC are laid bare. Because they are rooted in a "non-Indigenous" perspective, they simply cannot meet the needs of the collection. The needs of indigenous libraries like Aanischaaukamikw Cree Cultural Institute point to the many ways in which traditional classification schemes homogenize culture and commit "procrustean" violence on different ways of knowing.

Beyond simply pointing out the limits and boundaries of traditional classification systems, the development of BDC also points to a potential road forward for how other alternatives might emerge. The strengths and challenges of the "indigenization" of knowledge systems can help point to the ways in which similar systems can be designed or implemented. Perhaps the most successful and largescale adaptation of BDC occurred at the X̱wi7xwa Library at the University of British Colombia. Developed by librarian Gene Joseph, The X̱wi7xwa Library "knowledge organization system" (KOS) serves a collection of "15,000 items in digital and traditional formats including monographs, media, grey literature, serials, dissertations, maps, posters, realia, special collections and archival materials[97]" The X̱wi7xwa KOS consists of a classification scheme and a specialized thesaurus now recognized by LC, the First Nations House of Learning (FNHL) Subject Headings. Remarkably, this unique KOS built out of Brian Deer Classification has been successfully integrated into the larger catalogue of the University through specialized MARC records.[98] The success of this system cuts to the heart of my argument: the communities most marginalized by traditional classification systems are better served by the development of their own local knowledge organization systems.

In "Indigenization of Knowledge Organization at the X̱wi7xwa Library," librarians Ann M. Doyle, Kimberley Lawson and Sarah Dupont brilliantly illustrate the ways in which indigenous knowledge organization systems like BDC challenge mainstream conceptions within LIS. They argue that the "Indigenized knowledge organization system is critical to effective

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[96] Bosum, Annie, and Ashley Dunne. "Implementing the Brian Deer Classification Scheme for Aanischaaukamikw Cree Cultural Institute." *Collection Management* 42, no. 3–4 (October 2, 2017): 280–93. https://doi.org/10.1080/01462679.2017.1340858.

[97] Doyle, Lawson and Dupont, "Indigenization of Knowledge," 109.
[98] Ibid, 113.

Indigenous information and instructional services, programming and research at the Library."[99] Further, summarizing the impact of the BDC more widely, they suggest that "the BDC demonstrates the ways in which theoretical innovation transforms practice across space and time."[100] The example of X̲wi7xwa Library and its adaptation of BDC shows that resistance to the dominant classification and cataloging standards is possible within a large academic library. More importantly, it shows that by reclaiming the autonomy and power to organize knowledge within libraries, marginalized communities can resist the homogenization of the dominant classification systems and power structures. Indigenous LIS scholar Ann Doyle makes the argument exceedingly clear: "the development of meaningful knowledge organization systems for the Indigenous knowledges held within libraries is integral to the larger projects of Indigenous scholarship, research and pedagogy at local and global levels." [101] As Doyle makes clear, the dominant classification systems are simply not an option for libraries committed to serving the needs of indigenous communities.

Indigenous Knowledge Organization Systems also challenge the divisions between knowledge containing institutions like museums, libraries, archives. And by blurring these lines they also challenge the concept of a record and the idea of private ownership over materials. As Becvar and Srinivasan explain, "Because it is often orally transmitted, community owned, locally oriented, and tradition based, indigenous knowledge presents several challenges to how information professionals handle and provide access to it – specifically related to ownership of materials, attribution and authorship, and conditions of access."[102] The solution to these issues cannot be to fit indigenous knowledge into the rigid, subjective divisions agreed upon by LIS professionals. The solution must be to allow for indigenous knowledge to be organized, maintained, and preserved by the source communities of that knowledge. In this way, Indigenous knowledge organization systems serve a similar purpose to projects of object repatriation within museums or participatory description in archives. All these projects are vital and necessary to

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[99] Ibid, 114
[100] Ibid, 112
[101] Doyle, Ann M. "Naming and Reclaiming Indigenous Knowledges in Public Institutions: Intersections of Landscapes and Experience." Ergon Verlag, 2006. https://repository.arizona.edu/handle/10150/105581, 2.

[102] Becvar, Katherine, and Ramesh Srinivasan. "Indigenous Knowledge and Culturally Responsive Methods in Information Research." *The Library Quarterly* 79, no. 4 (October 1, 2009): 421–41. https://doi.org/10.1086/605382.

combat "the colonialist notion that the knowledge resources held by indigenous groups is a 'public domain' entity, available for the taking because it has been deemed 'folklore' or 'myth' and is thus upon to all."[103] Like Dewey and Cutter's imagined "public," this "public" almost always means the dominant, western, capitalist perspective. Indigenous knowledge organization systems like BDC challenge us and implore to examine these assumptions.

Recognizing this imperative, it is important to consider the methods by which similar alternatives might be produced. Bossum and Dunne speak from their experience with BDC when they suggest that "it is important to make sure someone with specialized knowledge of—and ideally, membership in—the community represented in the collection has a large role in the adaptation of the classification plan."[104] Thus, a fundamental challenge emerges for LIS professionals: we cannot simply design alternative classification systems without understanding the underlying ontologies and ways of knowing that guide and shape the community. Both Deer and Joseph were members of the community in which they worked, deeply embedded within the knowledge traditions and practices of the people they wished to empower. But what about those communities that do not have local, Indigenous librarians to bravely push forward with this work?

To aid in addressing this methodological roadblock, we can turn to parallel examples within other domains of information and technology development. In many ways, knowledge organization systems are simply a form of technology, and libraries, when viewed in their larger social and cultural perspective, are infrastructure. As Srinivasan illustrates profusely in *Whose Global Village?*, digital information technologies and infrastructures can be built in ways that respect and empower indigenous ontologies. The homogenizing effects that digital technologies can sometimes have is not a result of some intrinsic quality of technology itself. Likewise, knowledge organization systems do not necessarily have to erase the more local, individualized ways of knowing. The practice of designing knowledge organization systems could be a liberating pedagogical act that draws attention to the limits and boundaries of other systems. Thus, briefly turning to examples from other domains of development we can ask: What would it look like for library professionals to apply some of these same collaborative, community-based strategies in the domain of library classification systems?

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[103] Ibid, 15
[104] Bossum and Dunne, "Implementing Brian Deer," 289

One strategy that could be used to design library classification systems is exemplified in Srinivasan's "community-modeled ontology projects," Village Voice and Tribal Peace. Both projects built systems around the approach of "fluid ontologies," described as "the representation of information system content according to fluid, elicited descriptions articulated by community."[105] While these cases focused on building digital communications and sharing platforms, the methodology could certainly be adapted to help aid in the creation of new library classification systems. Librarians could adopt a collaborative approach wherein focus-groups help to narrow and define certain see key values or relationships between subjects and entities. From this "fluid ontology" trained cataloguers could try to map the community's ontology onto the collection in the library. Indeed, Srinivasasn suggests the possibility of such a project: "one can apply the fluid ontology approach to consider nondigital environments as well. One area of intervention could be in information institutions such as museums, libraries and archives."[106] Such a project within a library would be daunting, but as I have shown, intervention is necessary is if we are to stop the accelerating erasure of diverse ways of knowing.

In "Indigenous Knowledge and Culturally-responsive Methods in Information Research" Katherine Becvar and Srinivasan locate the common pitfalls and successful strategies used in collaborative development of Community Information Services (CIS) within Indigenous communities. Based off analysis of different practices within indigenous communities, they offer a "culturally-sensitive framework for developing community information services." While they are not directly addressing the creation of "knowledge organization systems," their framework would be extremely instructive to the creation of alternative classification systems. They suggest: 1) "collaborative methods" 2) "direct indigenous involvement" 3) "ensuring appropriateness" 4) "establishing the 'right kind of research relationship" and 5) "ownership of the project."[107] Using this framework, librarians could work collaboratively with indigenous communities to establish new, alternative ways to organize library materials, outside the confines of DDC and LCC. This would empower local communities to better use their own information because, as Srinivasan contends, "locally contextualized and authored information…can be comprehended, adopted,

[105]Srinivasan, Ramesh. "Where Information Society and Community Voice Intersect." *The Information Society* 22, no. 5 (December 1, 2006): 355–65. https://doi.org/10.1080/01972240600904324.

[106] Srinivasan, *Whose Global Village,* 138
[107] Becvar and Srinivasan, "Indigenous Knowledge"

and acted on more than information accessed from an alien context."[108] Within communities that do not adhere to the mainstream Western ways of knowing, LCC and DDC represent an "alien context." Thus, methods must be developed to recontextualize library materials within locally produced contexts.

Additionally, this work would have immense pedagogical value for both librarians and participants. By working with communities to establish their own classifications and knowledge organization systems, librarians would move away from what Paolo Freire calls "the banking model" of education and move towards a more liberating pedagogy. As summarized by Srinivasan, the banking model presumes that "access to externally authored information is the only means by which the global progress of the 'information society' may be achieved."[109] Rather than teaching "the right way" to catalog by imposing an external knowledge organization onto the materials within a community, librarians could turn cataloging into "a learning situation in which the cognizable object intermediates the cognitive actors-teacher on the one hand and students on the other."[110] In this example the "cognizable object" would be the community's information materials.

Thus far I have shown the ameliorative possibilities of bold, generative strategies within library classification system design, but of course, this argument has many limitations and caveats that must be addressed. While the example of the Xwi7xwa Library exemplifies a highly successful model for the development of alternative classification systems, many challenges remain for the library. In examining some of these challenges, the potentialities of more diverse knowledge organization systems can emerge. First, the most obvious drawback to these projects is the eradication of standards and shared protocols. This fragmentation leads to a breakdown in the libraries' ability to share information with other libraries and with people unfamiliar with the knowledge organization system. Rather than empowering communities, this breakdown in "interoperability" could lead to further marginalization. Standards are, of course, necessary. And by throwing out the standards of the dominant classification systems, libraries would in many cases remove themselves from the many conveniences and economies standardization offers. Thus, priority should be placed on building linkages and translations between different systems. Moreover, the organizations at the center of these systems, DCC and the Library of Congress are

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[108] Srinivasan, "Where Information Society,"
[109] Ibid
[110] Ibid

powerful institutions that will resist the "decentralization" of classification standards. Thus, these institutions should be approached as partners and possible allies.

The creation of specific local classification standards also gives rise to the problem of "mismatched ontologies." The ontologies represented in the large dominant classification systems will not align with those of the smaller systems. This disjuncture between the systems will cause "information loss." DDC and LCC attempt to capture and present "universal" systems and thus they function as "meta-ontologies" to the smaller more localized systems like DDC. In "Local-Global: Reconciling Mismatched Ontologies in Development Information Systems," Jessica Wallack and Srinivasan present strategies for reducing information loss when different ways of knowing are present. These strategies could also be used to make sure library classification systems operating at different scales could be reconciled. More specifically, they recommend "rethinking policymaking and institutional design along two dimensions to a) include more alternative channels for information flow to fill in gaps…and b) decentralize more decision making to subnational and local [institutions] that may operate on less-meta ontologies that are better matched to community ontologies."[111] Adapting these strategies from the realm of governance to library systems (which are certainly related), we can say that national library infrastructure should a) include more ways to affect change in standards from the bottom up and b) decentralize the standard-making bodies such as Library of Congress and OCLC (which maintains DDC). It is difficult to imagine what these systems would look like as decentralized networks, but if we are serious about respecting diversity and different ways of knowing we must start imagining such changes.

Perhaps the largest limitation to my argument is the vast amount of time and resources that such a project would require. Library budgets are already stretched thin and finding the time and resources to recatalog entire collections would be impossible for the vast majority of institutions. Nevertheless, the successful models detailed above show that such projects are not only possible, but ultimately extremely rewarding. Although it would take a lot of time, money and effort, LIS professionals could commit to using more ethnographic and collaborative methods to map local ontologies and create autonomous classification systems like BDS.

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[111] Jessica Seddon Wallack and Ramesh Srinivasan, "Local-Global: Reconciling Mismatched Ontologies in Development Information Systems," in *System Sciences, 2009. HICSS'09. 42nd Hawaii International Conference On* (IEEE, 2009), 1–10.

Moreover, when weighed against the options of the alternative, it is clear we must invest heavily in reshaping our information infrastructures and institutions. For, as Doyle explains:

> The international standardization of knowledge organization and subject representation systems enables unprecedented sharing of knowledge and also holds unprecedented power to erase local and regional knowledge domains. At risk are the voices that represent diversity of human experience, including the thousands of unique Indigenous cultures, languages, stories and ways of expressing them. The result could be the loss of representation and access to alternative ways of understanding, conduct and being in the world.[112]

Knowledge organization is at the very core of LIS practice. While it can sometimes be lost in the mundane and boring details of this work, we must remember that knowledge organization is a practice, a performance and an art. It may be the easy and economical choice to rely on the "international standardization of knowledge organization," but in the end, we are risking the loss of the earth's diversity of knowledge. The choice of a library classification system may seem trivial, practical and non-political, but by listening to the voices of those most effected by them, we can begin to see how deeply important these decisions are.

Classification systems, though powerful shapers of our experience, often go unnoticed and unchallenged. The standards developed through classification pervade our lived environments and knowledge systems. They are behind the design of our technologies and our infrastructures; they shape the way we navigate space and perceive time. Yet, despite their important role in structuring what is visible and what remains hidden, classification systems rarely receive intense scrutiny or attention. Librarians, however, as individuals trained to work within and around classification and cataloging systems, are in a unique position to help increase the visibility of classification systems more generally. Thus, even if the methods proposed here do not produce usable technologies or classification systems, they can still be valuable ways to expose the contingency and social-constructedness of library classification systems, and thereby create space for further critiques and new discursive possibilities.

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[112] Doyle, "Naming and reclaiming," 4

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<u>Elective Course Paper</u>
Virtual Artifacts and the Digitization of Cultural Heritage

Written for IS-289: *Museums in the Digital Age* with Prof. Miriam Posner, Spring 2018

Written at the end of my first year in the program, this paper reflects my growing interest in innovative and experimental digital methods for accessing archival and museum materials. The research I conducted for this paper challenged my prior conceptions about digital representations of objects and expanded my understanding of the role of the museum. By closely examining the Smithsonian X 3D initiative, I gained a greater understanding of the way museums are utilizing information technologies, and the overlap between digital preservation, archives and museum work. In revisiting the paper, I believe my discussion of "aura" in relation to the Kéet S'a<u>a</u>xw, or Killer Whale Hat, is overly simplistic and perhaps overlooks the complexity and specificity of this indigenous sacred object. A lengthier, more comprehensive examination of the Smithsonian's virtual artifacts is warranted.

Virtual Artifacts and the Digitization of Cultural Heritage

The 3D modeling of artifacts poses an intractable dilemma for cultural heritage museums.

On one hand, this emerging technology can offer effective new educational methods, increase visibility and access to collections, and help share valuable scientific and historic data that might otherwise be lost. On the other hand, by conflating these digital representations with the actual material objects, museums risk ignoring or obscuring the many non-visual, sensory qualities of artifacts. Thus, museums must be extremely careful and critical in their application of these technologies. Digital 3D models of cultural heritage artifacts lay bare the basic paradox facing museums today: how does an institution rooted in the preservation and display of material objects function in an increasingly "dematerialized," information-based world? How do the processes of digitization effect how an object is perceived and understood, and what responsibility does the museum have to help shape that understanding? What are the responsibilities and protocols of publishing digital 3D models and who should determine them? I argue that by replacing the embodied, affective experience of a physical object with digitally mediated "content," the museum fundamentally alters how we relate to these artifacts, and how we understand "cultural heritage."

For cultural heritage museums, the most practical and clearly advantageous application of 3D modeling is as a form of documentation. This documentary or "evidentiary" value stems from the initial step in the model-making process: the 3D scan. A 3D model is essentially an interactive digital visualization of a set of measurements and photographic images. At their core, these models consist of a dataset of "the surface geometry, on to which information about the

colour and other surface properties at each point is overlaid."[1] To create this dataset, the object

itself must be scanned or "captured." As a rapidly evolving and growing technology, standards

within this field are still emerging. There are a wide variety of different technologies and

methods for creating a scan, and most commonly, museums produce models through a

combination of multiple methods and types of scanning.

These scanning techniques can be broken down in two main categories: 1) "passive, in

which shape is derived from images of the scene, and [2)] active, where a laser or other light

source is projected into the scene and its interaction with the scene is measured."[2] The least

expensive and simplest of these, is a passive method known as "photogrammetry," in which the

geometry of a 3D object is derived by compositing a series of photographs taken from different

angles. Using inexpensive commercial software such as Stereo Scan or Autodesk ReCap one can

convert this series of overlapping images into a "point cloud" or "mesh" (essentially a dataset of

x-y-z coordinates) which can then in turn be edited and manipulated in computer aided design

(CAD) software[3] and 3D printed using stereolithography. Photogrammetry is the most wide-

spread and accessible technique because it can be accomplished (in relatively low resolution)

with nothing more than a digital camera. Moreover, these "passive" techniques have even been

used to retroactively "scan" artifacts and heritage sites that have been destroyed, or no longer

exist, using crowd-sourced images posted on the internet.[4] However, large cultural heritage

museums with dedicated "digitalization" programs such as the Smithsonian Institution and the

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[1] Arnold, David, and Jaime Kaminski. "3D Scanning and Presentation of Ethnographic Collections—Potentials and Challenges." *Journal of Museum Ethnography*, no. 27 (2014): 78-97. http://www.jstor.org/stable/43915864.
[2] Ibid.
[3] Champion, Erik. 2017. The Role of 3D Models in Virtual Heritage Infrastructures. In Cultural Heritage Digital Tools and Infrastructures European Perspectives, 15-35. Oxford and New York: Routledge.
[4] Morehshin Allahyari's "Material Speculation: Isis" project produced 3D models of 12 artifacts that were destroyed by ISIS in 2015, including a statue of King Uthal of Hatra from the Mosul Museum. See "Material Speculation: Isis," Morehshin Allahyari, accessed June 12, 2018. http://www.morehshin.com/material-speculation-isis/.

British Museum tend to employ the much more accurate and expensive "active" techniques for recording the surface geometry of an object. Currently, these techniques include, most notably, laser arm scanning and structured light scanning, in which the reflection of light off the object is measured from different angles in precise detail.[5] While the specific methods of these scanning or "capture" technologies are constantly evolving, the essential point for museums is that through these processes, they can produce an extremely detailed and accurate dataset describing and documenting the formal, geometric, and visual qualities of an object in their collection. And like photographic documentation or artist renderings before that, these 3D scans can be used for everything from monitoring conservation needs to assisting in scientific or historical research.

While these object-derived datasets have obvious documentary and evidentiary value, they also point to a central dilemma for cultural heritage museums: what is the relation between the data and the actual, material artifact? How can this immense set of measurements serve the mission of the museum in ways that go beyond mere documentation? In the United States, perhaps the most prolific and high-profile adopter of these technologies is the Smithsonian Institution, with their Smithsonian X 3D initiative. Their answer to this question, as indicated on their website is: "once an object or research site is scanned we are able to use that data in many different ways, including: deliver content online using our 3D Explorer, [and] allow schools to freely download and 3D print iconic Smithsonian objects in the classroom."[6] The language here is worth exploring in detail, because it cuts to the very heart of the digitization process and demonstrates the way in which these new technologies are shifting meanings within museums.

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[5] Smithsonian. "3D Scanning at the Smithsonian" Youtube video, posted May 13, 2013. https://youtu.be/AWoqTGEw7WA
[6] "3D Imaging Program," Smithsonian, accessed June 14, 2018. https://dpo.si.edu/3d-imaging-program

The use of the nebulous, yet ubiquitous internet-related term "content" here refers to the interactive 3D models, accessible through the Smithsonian's web-based, custom-built platform. This language echoes current trends in media and online publication, indicating that the Smithsonian clearly sees itself as the "producer" of this "content." In other words, their role as interpreter of the object is clear. On the other hand, they suggest that this data allows one to "print iconic Smithsonian objects" without any kind of qualifying term like "replica" or "model," thereby indicating a direct one-to-one identification between the digital model, the 3D print derived from this model, and the original physical object itself. While this may seem like an inconsequential, or semantic point, it is representative of a larger trend within museums to uncritically present digital or virtual versions of objects as surrogates for the objects themselves. Of course, this trend has been prevalent in libraries and archives for years, and it is in line with the colloquial usage of the term "digitize:" the information remains the same, it simply takes a new form. But if museums are now claiming that they can digitize not only texts, photographs and 2D art, but all kinds of material objects, it begs the question of what might be lost, or added to our experience of these objects in that process.

To explore this question, it will help to offer a case study of a digital 3D model and the way in which it is published and encountered online. As stated above, the Smithsonian has developed a custom "3D Explorer" in partnership with Autodesk, which allows online users to interact with a highly detailed, fully colorized digital 3D model of a scanned artifact. Still in "Beta," the Explorer allows visitors to engage with the 74 different 3D models currently published on the Smithsonian X 3D website, each "browsable" and searchable by title or keyword.[7] In a web browser, clicking on a model launches an embedded application that presents

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[7] "Smithsonian Digitization 3D," Smithsonian, accessed June 15, 2018, https://3d.si.edu/.

the user with an intuitive, simple interface for interacting with the "object". The user can "turn" the object or zoom in and out using simple mouse and keyboard commands, instructions for which are overlaid when opening the model. This allows the user to view the object from any angle in extreme detail. Set against a grayscale gradient background and overlaid with a "grid defining the ground plane,"[8] the model appears to float in an empty, 3D space. As Sarah Younan and Cathy Treadaway describe, "digital 3D models of museum artefacts are perceived 'in an unreal, virtual space that opens up behind the surface' of the computer screen" resulting in "a liminal space, somewhere between the tangible and the imaginary, with the potential to enable creative engagement with the experiential realm of the museum dream space." [9] So while the artifact appears both real and trustworthy, the user also recognizes the inherent "unreality" of the interaction and the virtual space.

This highly mediated and designed process (scan, model, website, "Explorer") allows viewers to experience qualities of the artifact that would be impossible even during an in-person encounter with a physical object. For example, with the Explorer, one can view small details on the underside of an armchair made by John Hewitt in 1810[10] or the inside of a bottle-shaped vase at the Smithsonian's Freer Gallery of Art.[11] Moreover, each Smithsonian X 3D model has a corresponding guided "tour," in which, by clicking on overlaid indicators, text descriptors appear and relay information about the object. According to the description on the Smithsonian X 3D website, "tours are similar to PowerPoint presentations, but are always 'live'. At any time during a tour, you can interact with everything you see in the viewer."[12] This kind of enhanced

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[8] "The Environment Tool Box," Smithsonian, accessed June 15, 2018, https://3d.si.edu/article/environment-toolbox.
[9] Younan, Sarah, and Cathy Treadaway. 2015. "Digital 3D models of heritage artefacts: Towards a digital dream space". *Digital Applications in Archaeology and Cultural Heritage.* 2 (4): 240-247.
[10] https://3d.si.edu/explorer/armchair-with-slip-seat-usa-ca-1820
[11] https://3d.si.edu/explorer/bottle-shaped-vase-f1982-19
[12] https://3d.si.edu/article/navigation-3d-and-25d

experience through digital tools is what then Secretary of the Smithsonian G. Wayne Clough advocates for in his 2013 book *Best of Both Worlds: Museums, Libraries and Archives in a Digital Age.* He argues, "there is a place for both the physical and the digital, with one complementing and leveraging the other. The physical museum offers visitors the opportunity to experience the real object and to share their impressions with family and friends, and also provides the content, expertise, and collections that digital museums draw upon. Digital access can then provide limitless opportunities for engagement and lifelong learning."[13] While Clough clearly recognizes the inherent difference between experiencing "the real object" and "digital access," he views both as an essential element of what he terms the "Smithsonian experience." And he continues, "The 'Smithsonian experience' is often described as a spark or catalyst that prompts curiosity. But this raises the question: why should such an experience be limited to those who can visit in person?"[14] Like the terminology regarding "content" creation, Clough's focus on digitally recreating "an experience" points to the question at the core of this issue: can the experience of encountering a piece of cultural heritage be recreated digitally, online? Are the "opportunities for engagement" in digital museums really "limitless?"

Smithsonian's 3D Explorer replicates the experience of an artifact's material, physical presence through an intensely mediated and designed virtual environment. By utilizing the detailed visual and geometric information gained through scanning, the museum can create a publishable virtual encounter with the artifact. Here we can see the final step in what Sandra Dudley has identified as "a view within museum studies and practice that the museum is about

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[13] Clough, G. Wayne. *Best of Both Worlds: Museums, Libraries, and Archives in a Digital Age*. Smithsonian Institution, 2013. https://doi.org/10.5479/si.9780981950013, 4.
[14] Ibid, 5.

information and that the object is just a part –and indeed not always an essential part–of that informational culture."[15] Echoing Clough's discussion of the physical/digital pairing, Dudley suggests that most museums are primarily concerned with displaying what she terms "object-information package[s]," or, cultural and informational framing mechanisms that attempt to "speak" for the paired objects. However, unlike Clough's more optimistic stance, she sees this as possibly limiting and minimizing the bodily, sensory experience of the materiality of the object itself.

While Dudley is primarily concerned with didactic displays and informational framing mechanisms within the museum, her critique of the "object-information package" can be applied to these digital framing mechanisms as well. Through the digital 3D model, we are told that the presence of the material object is not an essential part of our experience of it. And for Dudley the danger of this kind of practice is that the "object-information package…threatens to foreclose a more basic, but no less potent, bodily and emotional response to the material itself."[16] In other words, information about an object can sometimes diminish or at least "foreclose" upon our embodied, emotional response to its material presence. Even calling an object "cultural heritage" alters how we interact with it. But what is behind this "bodily response" to the "material itself" and is it replicable through a digitally mediated interface? Dudley's analysis focuses on our sensory and physiological interactions, but of course, within museums, objects are often behind glass and rarely is one permitted to handle or touch a cultural heritage artifact. Moreover, the digital 3D model offers an enhanced visual capability and even enables 3D printing, which allows for a tactile experience beyond the physical museum's capabilities. So, if our sensory capacities are in many ways enhanced through the virtual, information-based experience, what is

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[15] Dudley, Sandra H. *Museum Materialities: Objects, Engagements, Interpretations.* London: Routledge, 2010, 2.
[16] Ibid, 17.

it about the material presence of the object that is so important to our experience and understanding of it? By examining a particular Smithsonian 3D model, I will suggest two concepts that can help explain our embodied, emotional response to the presence of cultural heritage artifacts: aura and affect.

In this context, "aura" refers to the specific, unique spatial and historical qualities of an artifact. Walter Benjamin's influential and oft-debated essay "The Work of Art in the Age of Mechanical Reproduction" discussed the ways in which "reproductive" media like photography and film diminish the "aura" belonging to earlier art forms like painting or sculpture. Discussing the aura of traditional art he suggests, "even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be."[17] Benjamin's prescient insights about the effect of film and photography on the aura of artworks continues to be relevant, however more recently, many media studies scholars have challenged his conclusion that reproducibility diminishes the public's interest in the aura of artworks. Rather, as Bolter et al., argue "the desire for immediacy and for auratic experience has paradoxically survived in the face of increasing levels of mediation that digital technology makes possible."[18] Pointing to today's "new media" like virtual reality and augmented reality, they contend that "the specificity of the here-and-now" is still a powerful part of the way people relate to art and media.

The Smithsonian's 2012 replication of the Kéet S'aax̱w, or Killer Whale Hat, clearly demonstrates the power and importance of an artifact's "aura" in the face of its "reproducibility." In 1904, the sacred carved wooden hat was taken from the Tlingit Dkl'aweidi Clan by

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[17] Benjamin, Walter, and Hannah Arendt. *Illuminations: Essays and Reflections*. Doubleday, 2012, 220.
[18] Bolter, Jay David, Blair MacIntyre, Maribeth Gandy, and Petra Schweitzer. "New Media and the Permanent Crisis of Aura." *Convergence* 12, no. 1 (February 1, 2006): 21–39, https://doi.org/10.1177/1354856506061550.

Smithsonian ethnologist John Swanton.[19] It remained at the Smithsonian until finally being

repatriated to clan leader Mark Jacobs, Jr. in 2005. On the day of its repatriation, the hat was

used in a Tlingit ceremony for the first time in over 100 years. Then, according to Smithsonian

Magazine,

> in April 2010, [the new clan leader Edwell John, Jr.] brought the Killer Whale hat
> back to Washington, D.C. Over the next two years, the Smithsonian worked closely
> with John to create a copy that was both respectful of Tlingit culture and suitable
> for education purposes. Digitization experts laser-scanned the hat, bouncing a beam
> off of its surface and deriving measurements from the time it took the laser to
> bounce back, and also collected 3D data through an imaging technique called
> photogrammetry…The hat underwent a fairly straightforward digitization
> process…After digitization, the virtual model was translated into reality by a team
> of Smithsonian model makers with the help of a CNC milling machine, which
> carved the replica out of alder wood. Finally, the team added paint, abalone shells,
> hair and a trailer of white ermine skins.[20]

While the replica and original hat are nearly physically and materially identical in almost every

way, clearly, they differ in their auratic presence. For the Tlingit, the original and replica are not

just different hats of the same form, they are entirely different types of things with entirely

different meanings and ontological realities. The replica and the 3D model can be used for

educational and documentary purposes, but they are not sacred objects, they are not what the

Tlingit call "At.óow." The difference relates directly to each hat's aura. According to

Smithsonian.com: "objects become at.óow during a memorial potlatch. At this ceremony,

representatives of the opposite moiety recognize the unveiling of an official clan crest object.

Without this acknowledgement, the object is considered a piece of personal property, not

at.óow."[21] In other words, it is the hat's aura, its "presence in time and space" and it's "unique

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[19] Solly, Meilan, "This Replica of Tlingit Killer Whale Hat is Spurring Dialogue About Digitization,"
Smithsonian.com, accessed June 15, 2018, https://www.smithsonianmag.com/smithsonian-institution/replica-
tlingit-killer-whale-hat-spurring-dialogue-about-digitization-180964483/.
[20] Ibid.
[21] Ibid.

existence at the place where it happens to be" that determine its meaning. And that aura is not scannable or reproducible through an online portal or 3D printing. So, while the replica may be physically identical, and even "invoked the emotional response typically associated with real at.óow[22]" the two hats (and the digital 3D model) each have entirely different uses, meanings and cultural relevancy. The example of the Tlingit Killer Whale Hat indicates that, in some cases, an object's meaning is determined by its aura and unique materiality, which cannot be represented through digital reproductions. But, on the other hand, as will become clear, it also indicates that digital representations and reproductions can powerfully alter the way we understand and interact with historical artifacts.

When offered as a surrogate for the original, digital 3D models of historical artifacts can shape the affective power of those artifacts in radically new ways. For example, at the behest of the Tlingit people, the 3D model of the Killer Whale Hat is one of the few models on the Smithsonian X 3D website that is not available for download and 3D printing, because "Tlingit crests have been appropriated for commercial purposes in the past, and digital files are easily downloaded and abused. The replica…depicts the clan crest and is protected by the Tlingit's cultural property rights." [23] The power of the 3D model and its capacity to be "abused," points to the way in which different digital technologies can shape our understanding of artifacts. So, even though the original sacred, auratic hat has been returned, the 3D model still contains some element of its presence and its meaning through symbols, crests and other information. Thus, I suggest that our understanding of cultural heritage artifacts depends on more than mere information alone and more than material presence alone, but a combination of these factors, an

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[22] Ibid.
[23] Ibid.

embodied and "situated" response which we can understand as "affect." For, as Brian Massumi describes, "the body doesn't just absorb pulses or discrete stimulations; it infolds contexts, it infolds volitions and cognitions that are nothing if not situated."[24] Interacting with a 3D model of a cultural heritage artifact on a computer screen elicits its own affective and embodied response, different than, but informed by the material artifact. As Massumi suggests, mind and body "could be seen not as binary oppositions or contradictions, but as resonating levels. Affect is their point of emergence, in their actual specificity, and it is their vanishing point, in singularity, in their virtual coexistence and interconnection – that critical point shadowing every image/expression/event."[25] This "virtual interconnection" between mind and body, affect, is shaped by not just what we can see, hear and touch, but the entire context of our situation and context, our emotions, our embodied relation to the space we are in, and our sudden, unexplainable reactions to certain images or objects. Further, our affective response matters to the way we ultimately understand heritage artifacts, because, as Jenney Newell argues, "historical understandings and engagements with history are not only created through information and the analysis of data, they are also formed by the learning that occurs through sensory, emotive responses."[26] In other words, our affective response to artifacts shapes the way we understand history. And because digital 3D models elicit vastly different affective responses than material artifacts, these models have a power to shift the way we understand our material history. Therefore, they must be produced and published critically and carefully, with extreme deference to source communities and other communities invested in the artifacts.

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[24] Massumi, Brian. "The Autonomy of Affect." *Cultural Critique*, no. 31 (1995): 83-109. doi:10.2307/1354446.
[25] Ibid, 94.
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<u>Elective Course Paper</u>
Special Collections Librarianship and The Future of Born-Digital Materials

Written for IS-439: *Special Collections* with Prof. Anna Chen, Winter 2019

Assigned to "reflect on some aspect of special collections librarianship," in this short paper, I built upon my research into emulation technologies to imagine a new, "post-codex" future for special collections. While most of our course readings dealt with rare books, unique manuscripts and paper artifacts, I used this opportunity to investigate my overlapping interests in digital preservation and accessibility of special collections materials. Highlighting the materiality of born-digital materials, this paper pairs well with my portfolio issue paper to express my growing interest in the preservation of complete, "authentic" representations of obsolete media. In addition to a brief discussion of emulation, I used a "media archeology" lens to highlight the importance of the physicality of computing hardware and hoped to show that archival representation of born-digital materials remains an important and under-explored topic within special collections. A lengthier treatment of this subject would benefit from more in-depth case-studies of specific technologies and digital objects and the costs and feasibility of incorporating "retro-computing" into reading rooms.

Special Collections Librarianship and The Future of Born-Digital Materials

By considering current tools in digital preservation and examining emergent trends in access to born-digital materials, in this paper, I will identify the shifting priorities and core knowledge requirements of special collections librarianship. This paper suggests that special collections libraries at academic research institutions should devote more resources to the collection, preservation, and documentation of obsolete born-digital media and related historic computing equipment.

Over the last two decades, as born-digital materials have begun to flood into archives and special collections, most institutions have primarily focused their resources on accurately ingesting and preserving these records, while paying little attention to the means by which they would eventually be accessed.[113] By migrating material off of obsolete carriers like floppy disks and CD-ROMs, digital preservationists have saved otherwise at-risk cultural artifacts and staved off the inevitable physical deterioration of these resources. The increasing availability and reliability of digital forensics tools such as checksums, write blockers,[114] and BitCurator[115] has made this task more reliable and standardized, but a major issue still looms: many of these preserved files are no longer readable by contemporary computers. Moreover, due to the rapid evolution and increasingly proprietary nature of file formats, the files that are still readable require highly specialized or obsolete software to properly run.[116] While there are many programs that offer backwards compatibility with older file formats, recent research has shown

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[113] Julia Kim, "Researcher Access to Born-Digital Collections: An Exploratory Study," *Journal of Contemporary Archival Studies* 5, no. 1 (May 25, 2018), https://elischolar.library.yale.edu/jcas/vol5/iss1/7.
[114] Matthew G. Kirschenbaum et al., *Digital Forensics and Born-Digital Content in Cultural Heritage Collections*, CLIR Publication, no. 149 (Washington, D.C: Council on Library and Information Resources, 2010).
[115] "Https://Bitcurator.Net/," accessed March 16, 2019, https://bitcurator.net/.
[116] Jessica Meyerson et al., "The Software Preservation Network (SPN): A Community Effort to Ensure Long Term Access to Digital Cultural Heritage," *D-Lib Magazine* 23, no. 5/6 (May 2017), https://doi.org/10.1045/may2017-meyerson.

that "[w]hen files are rendered in environments that differ from the original then they will often present altered information to the user."[117] For institutions dedicated to authenticity and trust, such as libraries and archives, these alterations must be taken seriously. So, the question remains, how will libraries and archives provide researchers with access to their growing collections of born-digital materials?

In his 2014 keynote address at "Acknowledging the Past, Forging the Future," Stephen Ennis recognizes the ever-increasing importance of born-digital materials and notes that "[w]hat is most needed now is not tools, I think, but policies that will guide the access and use of this growing resource."[118] While Ennis is certainly correct to draw attention to the problem of researcher access, the division he draws between tools and policies is not quite as clear as he indicates. The policies for providing access to born-digital collections must be guided by a clearer understanding of the tools that are necessary to properly do this task. And the nature of those tools is a matter that is still very much undecided. Special collections librarians must begin to more seriously reckon with the question: what does access to born-digital material actually look like?

One of the most promising and rapidly evolving ways to provide this access is through the use of emulation. A full technical explanation of emulation is beyond the scope of this paper, but essentially it is a means by which a "virtual machine" is implemented on a host computer. This implementation can then run "unmodified software binaries" designed for the system

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[117] Euan Cochrane, "Rendering Matters-Report on the Results of Research into Digital Object Rendering," *Archives New Zealand*, 2012.
[118] case, *Objects of Study: Special Collections in an Age of Digital Scholarship: Stephen Enniss*, accessed March 20, 2019,
https://www.youtube.com/watch?v=DofAdsej7Yg&t=0s&index=7&list=PLBELrG1nZ2U5jXND2u48h4RScCZwngM5g.

running on that virtual machine.[119] In other words, by virtually imitating a specific configuration of hardware and "machine code," emulation allows for software code to be run on computers on which it could normally never run. Emulation is not a new technology, and it has been used for preservation purposes dating back to at least 1995, but due to its high cost and required level of technical expertise there have until very recently been few examples of its use in special collections. [120]

The earliest successful and most highly publicized use of emulation by a research library in the United States was Emory University's processing of the Salman Rushdie papers in 2007.[121] [122] Through negotiations with Rushdie, in late 2006, Emory University's Manuscript, Archives, and Rare Book Library (MARBL) acquired, along with his traditional paper archives, "a nearly complete record of Rushdie's digital life, consisting of four computers…one hard drive…and several disks."[123] Rather than simply migrating the digital materials off of the computers to store as discrete files, MARBL created a disk image of Rushdie's earliest computer hard drive, a Performa 5400, and then created an emulated version of this exact machine on a researcher workstation in their reading room. After processing, removing, and reloading some of the original files, this allowed researchers to "launch an exact replica of Rushdie's Performa 5400 with all of its authentic and at times unstable, mid-1990s Mac attributes."[124] By allowing researchers access to the contextual environment of Rushdie's born-digital records, MARBL drew attention to the historical

[119] David S.H. Rosenthal, *Emulation & Virtualization as Preservation Strategies*, a report commissioned by The Andrew W. Mellon Foundation, New York, October 2015, https://mellon.org/Rosenthal-Emulation-2015

[120] Rosenthal, "Emulation & Virtualization as Preservation Strategies."

[121] Salman Rushdie papers, Stuart A. Rose Manuscript, Archives, and Rare Book Library, Emory University.

[122] Dan Rockmore, "The Digital Life of Salman Rushdie," July 29, 2014, https://www.newyorker.com/tech/annals-of-technology/digital-life-salman-rushdie.

[123] Laura Carroll et al., "A Comprehensive Approach to Born-Digital Archives," *Archivaria* 72 (2011): 61–92, 64.

[124] Carroll et al., 84

relevance and materiality of software, and pointed to a new future for born-digital personal

paper collections. In a 2010 article, Carroll et al. describe the reasoning behind their use of

emulation:

> Ultimately, we decided that the context and medium of twentieth and twenty-first century archives are of equal importance as those of pre- and post-Gutenberg collections. Scholarly interest in incunabula, early publishing practices, bindings, paper, manuscript hands, marginalia and back matter surely will be mirrored in scholarly research into literary and creative production in the late twentieth century and on. Identifying, categorizing, preserving, and providing access to the materiality of born-digital personal archives can be of equal importance as attending to the content, depending upon the extent, medium and state of a given collection.[125]

In many ways, Carroll et al.'s predictions have already come to fruition, as there has been a

recent proliferation of scholarship on the historical and cultural importance of software[126]

and the emergent field of media archaeology has placed new attention on the materiality of

the digital.[127] By providing researchers with "the full digital paratext – the native

environment and context," Carroll et al. hoped to "enabl[e] research not only into the

content but also the technological medium itself and how it might impact literary

production."[128] While it is likely still too early to tell the full impact of this newly available

resource, the immense research value of emulation is clear. Moreover, building off the

successes of MARBL, several more recent projects have also effectively used emulation to

provide access to born-digital special collections materials, most notably New York Public

Library's processing of video games on floppy disks in the Timothy Leary Papers and New

York University's treatment of 1990s era Photoshop files from the Jeremy Blake Papers.[129]

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[125] Carroll et al., 79.
[126] For example see the "Software Studies" series from The MIT Press, accessed March 15, 2019, https://mitpress.mit.edu/books/series/software-studies.
[127] For example, see https://monoskop.org/Media_archaeology for a list of recent texts and scholarly courses.
[128] Carroll et al., "A Comprehensive Approach to Born-Digital Archives," 82.
[129] Dianne Dietrich et al., "How to Party Like It's 1999: Emulation for Everyone," *The Code4Lib Journal*, no. 32 (April 25, 2016), http://journal.code4lib.org/articles/11386.

Despite these successes, emulation alone cannot solve the problems of born-digital access. MARBL's innovative use of emulation to provide access to the born-digital materials in the Salman Rushdie Papers is still lacking in one major way: the physical hardware of the Performa 5400 is removed from the researcher's experience. In order to preserve the original computer, researchers must access the files through the hardware of the workstation computer in the reading room. This points to one of the major draw backs of using emulation as an access tool. As director of the Media Archeology Lab (MAL) Lori Anderson explains in reference to her work on early electronic literature, "Emulation will never be able to replicate the entire physical, sensory, tactile experience of working on the original machine. The clackety-clack of the keyboard, the act of taking the 5.25″ floppy out of its sleeve, sliding it into the drive, hearing the whir and beep of the machine, the ability to open up the hood and insert an expansion card is integral to the reading/writing experience."[130] Despite MARBL's commitment to the "full digital paratext," the emulation is still lacking in its representation of the physical, material reality of Rushdie's computing environment. To more accurately and truly represent this full context, the library would need to have a version of the old Performa 5400 for access use. Obviously, with the vast and ever-expanding variations of computers that have been produced throughout the last 50 years, no institution could be expected to own a comprehensive or even significant portion of this set. Nevertheless, there are a growing number of institutions, both amateur and professional, that are committed to maintaining the material history of computing, and special collections libraries would be wise to look to these groups for

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[130] Trevor Owens, "Media Archaeology and Digital Stewardship: An Interview with Lori Emerson | The Signal," webpage, October 11, 2012, https://doi.org///blogs.loc.gov/thesignal/2012/10/media-archaeology-and-digital-stewardship-an-interview-with-lori-emerson/.

collaboration and guidance.[131] For example, recent work by John Durno at the University of

Victoria Libraries has shown the immense value of partnering with amateur enthusiasts to access

and recover data stored on floppy disks from the 1980's.[132]

Driven primarily by private collectors and amateur enthusiasts, "retrocomputing" is

rapidly emerging as a valuable and promising source of new research and scholarship. In his

2013 essay "Ancient Evenings: Retrocomputing in the Digital Humanities" Mathew

Kirschenbaum demonstrates the value of maintaining obsolete computing environments within

the growing academic discipline of digital humanities. He defines retrocomputing as "a set of

hands-on practices devoted to preserving, engaging, and extending the historical legacy of

outdated and outmoded computer systems for purposes of documentation and recovery,

education, experimentation, critical and artistic expression, and sheer satisfaction."[133] While

Kirschenbaum never draws a direct comparison to the history of rare book collecting, the

parallels are clear. And just as rare book collectors, enthusiasts and hobbyists played an essential

role in the development of many special collections, so too should the retrocomputing

community. Noting this potentially important role for the retrocomputing community, Yuri

Takhteyev and Quinn DuPont point out that "the collection and preservation efforts of

retrocomputing enthusiasts … fill an important gap in the work of traditional memory

institutions."[134] This important gap cannot be filled by any single institution alone, nor will it

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[131] Patricia Galloway, "Retrocomputing, Archival Research, and Digital Heritage Preservation: A Computer Museum and ISchool Collaboration," *Library Trends* 59, no. 4 (2011): 623–36, https://doi.org/10.1353/lib.2011.0014.
[132] John Durno and University of Victoria Libraries, "Digital Archaeology and/or Forensics: Working with Floppy Disks from the 1980s," *The Code4Lib Journal*, no. 34 (October 25, 2016), http://journal.code4lib.org/articles/11986.
[133] Matthew G. Kirschenbaum, "Ancient Evenings," in *A New Companion to Digital Humanities* (John Wiley & Sons, Ltd, 2015), 185–98, https://doi.org/10.1002/9781118680605.ch13.
[134] Yuri Takhteyev and Quinn DuPont, "Retrocomputing as Preservation and Remix," *Library Hi Tech* 31, no. 2 (June 7, 2013): 355–70, https://doi.org/10.1108/07378831311329103.

ever be fully filled (there will always be gaps and absences), but special collections libraries can and should play an important part in that attempt.

Because special collections and rare books librarians' have such a long-held commitment to preserving and documenting the material and physical qualities of textual objects, they should be well suited to adapt their skills to considering new forms of text that transcend the traditional codex. Despite their new form, born-digital objects are, like books, physical things, and the ways in which we should preserve and steward these objects for future use is still very much taking form. Special collections libraries must develop strategies that center the physical materiality of digital objects. Research institutions should seek to maintain a more authentic version of the embodied, sensory way born-digital materials are used. In other words, if the value of special collections research is going to transcend the era of the printed book, librarians must begin learning and documenting the new rapidly disappearing forms of cultural production.

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Course List

Fall 2017
IS-211 Artifacts and Cultures, Prof. Johanna Drucker
IS-260 Description and Access, Prof. Jonathan Furner
IS-431 Archives, Records, and Memory, Prof. Anne Gilliland

Winter 2018
IS-270 Systems and Infrastructure, Prof. Miriam Posner
IS-289 Theory and Politics of Collecting, Prof. Shawn VanCour
IS-480 Introduction to Media Archiving and Preservation, Lecturer Snowden Becker

Spring 2018
IS-212 Values and Communities in Information Professions, Prof. Ramesh Srinivasan
IS-289 Museums in the Digital Age, Prof. Miriam Posner
IS-433 Community-Based Archiving, Prof. Michelle Caswell

Fall 2018
IS-289 Digital Methods in Research and Scholarship, Prof. Johanna Drucker
IS-289 Intellectual Property Law for Libraries and Archives, Lecturer Mikka Gee Conway
IS-289 Sound Technologies and Society, Prof. Shawn VanCour
German-375 Teaching Apprentice Practicum, Prof. Renata Fuchs

Winter 2019
IS-289 Moving Image Technologies, Lecturer Dino Everett
IS-439 Special Collections, Lecturer Anna Chen
IS-438B Archival Description and Access Systems, Lecturer Kathy Carbone
German-375 Teaching Apprentice Practicum, Prof. David Kim

Spring 2019
Art History-C270A Museum Studies, Prof. Solani Mathur
IS-289 Home Movies: Preservation, Identification, and Repatriation, Lecturer Snowden Becker
Jewish Studies-M155: Magic, Mysticism and Apocalypse in Jewish Traditions, Prof. Catherine Bonesho
German-375 Teaching Apprentice Practicum, Prof. Todd Presner

Professional Development Statement

After three years working in public libraries, I entered the MLIS program at UCLA with a diverse set of wide-ranging interests and professional goals. For the past two years my course work has focused on media archives and preservation, community archives, museum studies, moving image technologies, sound technologies, archival description and access systems and special collections librarianship. As museums, archives and libraries have begun to converge and overlap in many of their core activities, I have attempted to place my professional future at the center of this overlap. I envision myself working within the special collections of a large research institution or university, a small community-based or local archive, or a museum's archives and library. The primary focus of my academic study has been the preservation, description and accessibility of obsolete media formats, from magnetic tape audio recordings and small gauge film to complex digital objects and software-dependent materials. As many collecting institutions have now expanded their scope far beyond traditional paper archives, I believe these skills will become increasingly relevant to archival work at all levels. Thus, my short-term professional goal is to gain extensive hands-on experience processing and describing archival collections, in order to more fully realize the technical proficiencies necessary to work with diverse media formats.

While much of my professional experience and coursework has focused on obsolete analog media such as film, videotape and grooved audio, a newfound interest in digital preservation has inspired me to seek out avenues for additional professional development within this specialization. While I was unable to take courses in digital asset management, human computer interaction or user experience design during my time in the program, I now recognize how vital these skills are for working with born-digital archival records. Through ongoing

conversations with UCLA Digital Archivist Shira Peltzman, I have identified some of the most valuable workshops and conferences to help develop these skills as I enter the workforce. The annual Bitcurator User Forum, at which I volunteered last year, will be an especially useful resource for gaining knowledge of new tools and best practices within digital preservation, and I hope to be able to attend the forum again in the near future.

As I enter the workforce, I am especially interested in gaining experience working with born-digital materials, because I believe this to be an under-emphasized yet growing area of need, especially within research institutions and personal papers collections. While I feel that I have a firm grasp on the ethical and theoretical grounding for this type of work, I recognize that I lack much of the technical knowledge and practical skills and proficiencies required to be a leader in this field. So, over the next five years, as I gain more hands-on experience processing archival materials, I also plan to complete the SAA's Digital Archives Specialist (DAS) Curriculum and Certificate Program, which, through a structured curriculum of tiered courses, covers the core competencies and tools of digital archives work. I recognize that regardless of the exact field I enter, I will need to commit to lifelong professional development and training, especially when working within the rapidly evolving and shifting world of digital records.

In my role as the University Archives Project Scholar in UCLA Library Special Collections' Center for Primary Research and Training, I was able to gain experience analyzing and working with legacy collections data. I not only gained a greater understanding of the behind-the-scenes, often unrecognized work that goes into the management of archival collections, I also developed new skills and proficiencies that I will carry with me throughout my career. Working with the University Archives legacy data, I also developed a newfound appreciation for database maintenance and records management. I now recognize that these skills

are essential to archival work and plan to take advantage of the many free and accessible online tutorials for data management tools and programs. Moreover, through my conversations and collaborations with my supervisors and other archivists within library special collections, I learned of the wide-ranging skillsets necessary for work within special collections and I began to focus my professional interest on the vast, under-processed and inaccessible digital and analog media material housed and sometimes hidden within large institutional archival collections.

Whatever my future career entails, I hope that outreach, instruction and education will be a major part of my duties, and thus I am extremely grateful for the experience I've gained over the last year as a teaching assistant in the Germanic Languages department. As a teaching assistant, I have grown immensely both academically and professionally. In the past year, I have honed my pedagogical skills by instructing and supporting over 180 students, designing lesson plans, leading weekly discussion sections and grading hundreds of critical essays. I have thoroughly enjoyed my time teaching and I look forward to further developing these skills through trainings such as the SAA's "Teaching with Primary Sources" professional development course or through training opportunities offered through employment at large research or educational institutions. I understand that engaging with researchers and users is a major, sometimes overlooked aspect of archives work, but I look forward to developing this professional strength even more as I continue my career.

As I have become more familiar with the many challenges and common obstacles to archival and media preservation work, I have grown to appreciate and value the role of professional organizations even more. Recognizing that many of the profession's most pressing issues will need to be addressed collaboratively and at scale, I look forward to becoming an active member in as many relevant professional organizations as my time will allow. While I

have yet been unable to attend any major professional conferences, I am a member of the Society of American Archivists, and I have been actively involved in the student chapters of the Special Libraries Association (SLA), the Association of Moving Image Archivists (AMIA), and the Association of Recorded Sounds Collections (ARSC). I have found these groups to be invaluable resources for connecting with professionals and maintaining an up-to-date understanding of the most relevant and pressing issues in the field. With ARSC, I have attended multiple workshops, site visits and lectures, which have greatly enhanced my knowledge of the field and introduced me to other professionals. The specific organizations I end up joining will likely be a result of the specialization or focus of the archive or library where I find employment. My major short-term professional development goals include attending at least two national conferences in the next year. In addition to the conferences of the groups mentioned above, I have closely followed the itineraries and programs of the Code4lib conference and the DLF Forum, both of which I plan to attend within a year.

I have also gained valuable leadership and organizing skills through my work with README, a newly formed student group in the Information Studies department dedicated to privacy and digital rights in relation to information work. As a lead organizer with README, I created educational literature, presented at multiple conferences, co-organized and lead a summer book club, hosted weekly lab hours, planned and organized major events and workshops and helped cultivate a growing cooperative student group. My work with README has led to some of the most rewarding and fulfilling experiences of my time in the program and I look forward to further developing these organizing and collaborative movement-building skills as I enter the workforce. I look to organizations like the Electronic Frontier Foundation and the Software Preservation Network as powerful examples of the impact collective organizing and

advocacy can have, and I plan to become actively involved in these organizations as I gain more

firm professional footing. Finally, I recognize that continued collaboration and conversation with

my peers will be an essential part for my professional development; I am inspired by my peers in

this cohort and I look forward to our future impact on the profession and shared growth.

Advising History

Over the course of my two years in the program, I have received invaluable support and guidance from several faculty members, professional mentors and unofficial advisors. I started the program with little idea of my eventual area of specialization, and throughout my first year, at different times, I expressed interest in pursuing each of the five specialization tracks. In our first meeting, my academic advisor, **Dr. Leah Lievrouw**, encouraged me to explore these diverse areas interest and to develop my specialization by taking a wide range of courses. In late October 2017, we had a lengthy discussion via Skype about my interest in PhD programs in Information Studies. I have since decided not to pursue a doctorate degree at this time, and Dr. Lievrouw's guidance during my first year was extremely helpful in weighing the pros and cons of this decision.

During Dr. Lievrouw's sabbatical in the fall quarter of my second year, we exchanged multiple emails regarding my progress towards graduation and the initial formation of a portfolio issue topic. Upon her return from sabbatical in the winter quarter, Dr. Lievrouw and I met twice during office hours to discuss portfolio requirements and to review my draft issue paper. In January, we met via video conference to again discuss portfolio requirements and to check in on my progress. Finally, throughout February Dr. Lievrouw has reviewed multiple drafts of my portfolio elements and provided valuable feedback, shaping my continued professional development.

Additionally, since my first week in the "media archives bootcamp" in September 2017, **Snowden Becker** has played an important role in helping shape my experience in the program and my professional development. Most notably, in November, during Dr. Lievrouw's

sabbatical, Prof. Becker met with me to discuss my portfolio issue and helped me conceptualize

my specialization and professional interests. Also, throughout the program I have taken multiple

courses with **Dr. Shawn VanCour** whose mentorship and advice has helped me understand and

make connections within the media archives profession. Finally, during my working in the

Center for Primary Research and Training, my supervisors **Courtney Dean** and **Lori Dedeyan**

advised me on a number of issues ranging from online training tools and required archival

skillsets to labor issues and institutional politics.

Accessibility Statement

In creating this digital portfolio, I attempted to place the user at the center of all my design decisions. I have focused on creating a simple, straight-forward and intuitive experience that avoids unnecessary design elements or confusing navigation. Using large type-face, boldly contrasting color values (mostly black on white), and a simple structure, this minimalist website is intended to effectively facilitate the distribution of my portfolio materials. I have included alt-text for the singular photographic image to facilitate the use of screen readers and all linked documents are available in PDF format to allow for maximum interoperability. I also tested the accessibility of my site using the WAVE web accessibility evaluation tool (http://wave.webaim.org/). While the I have attempted to closely adhere to the Accessibility Principles outlined by the Web Accessibility Initiative, I recognize that the use of linked PDF files rather than plain text documents may pose a challenge for screen readers and other assistive tools. As I develop my personal website for more general use and widespread publication, I will be sure to monitor the site for additional accessibility issues. The most substantive design decisions concerned which documents should be hosted as simple html webpages and which should link to a hosted PDF file. In the end, I decided that for any document longer than a single page, I would link out to a hosted PDF file. While this does require the user to occasionally navigate with the browser's "back" button, I believe the added ability to download individual files and the increased readability warranted this decision.

In addition to these design choices, I also intentionally avoided using proprietary and commercially focused web-development and hosting tools like Squarespace or Wix. Rather, by hosting my material in a github repository and building my site with Jekyll, an opensource static site generator, I was able maintain a level of control and autonomy that I believe is an important

part of providing continued accessibility to online content. While other hosting and web-design tools may offer simpler backend usability and more pre-set design options, github and Jekyll are both part of an opensource community that offers extensive online documentation and support. Moreover, they are both tools that are committed to the ethical sharing of information and collaboration. Much of my academic and organizing work in this program has focused on the often overlooked and ignored consequences of information technologies, so I wanted to make sure that the tools I used to create my portfolio were in line with my values.

Finally, I have also included a printer-friendly PDF version of my portfolio. This version does not substantially differ from the web-based version other than in ease of navigation and the absence of the "additional supporting materials," which rely on links to external websites. While the website version allows users to access to two online digital projects, the PDF version simply includes the project URLs. The PDF version also differs in a few font and design characteristics especially in the list of courses and advising history.

Asa Carl Wilder

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EDUCATION

University of California Los Angeles   **Los Angeles, CA**

MLIS, Archival Studies, Media Archival Studies, 4.0 GPA   Expected June 2019

Grinnell College   **Grinnell, IA**

BA, Philosophy   June 2010

Dean's List Recipient, 3.6 GPA

Katholieke Universiteit   **Leuven, Belgium**

Program in European Culture and Society   Fall 2009

EXPERIENCE

UCLA Department of Germanic Languages   **Los Angeles, CA**

Teaching Assistant   September 2018 - Present

- Supported and advised over 160 undergraduate students throughout three courses
- Lead weekly discussion sections, designed lesson plans and graded course work
- Provided instruction in writing, film analysis, literary analysis and primary source research

UCLA Library Special Collections – Center for Primary Research and Training   **Los Angeles, CA**

University Archives Project Scholar   June 2018- September 2018

- Reviewed and organized legacy collections data
- Processed archival collections
- Planned and implemented large-scale data migration for new record management system

UCLA Library Print Acquisitions   **Los Angeles, CA**

Senior Clerk   October 2017- September 2018

- Received, processed and prepared monographs for cataloging
- Reviewed, edited and approved catalogue records
- Inspected and sorted monographs for shelf-readiness

Kansas City Public Library - Central Branch   **Kansas City, MO**

Library Reference Associate   March 2016 – September 2017

- Provided in-depth research assistance and readers' advisory services
- Instructed and facilitated use of library resources
- Assisted colleagues from any location or department with complex reference questions

Library Technical Assistant   July 2014- March 2016

- Assisted patrons with locating and checking out materials
- Registered new accounts and issued library cards

The Zz School of Print Media   **Kansas City, MO**

Head Librarian and Studio Technician   September 2014- July 2017

- Developed, cataloged, and managed lending library of over 1,000 items
- Organized and facilitated public symposium on collectors and collecting
- Assisted in print shop maintenance and management
- Assisted with curriculum development and advised on mission and direction

Marr Sound Archive - Miller Nichols Library   **Kansas City, MO**
Archive Intern/Page   September 2013 – June 2014
- Cataloged and created finding aids for special collections
- Assisted archive staff with shelving, intake and organization
- Wrote and published multiple posts for the Archive's blog, *Scripts and Groove*s

Beyond Housing, Inc.   **St. Louis, MO**
Community Engagement Americorps VISTA   June 2012 – April 2013
- Organized and oversaw "Ambassadors" resident group with over 30 members
- Established and maintained community "information hubs"
- Organized and ran community meetings and events

Alternative Directions, Inc.,   **Baltimore, MD**
Paralegal   September 2010 – March 2012
- Designed and conducted legal workshops in prisons throughout Maryland
- Maintained and updated case-tracking software and database
- Trained and supervised volunteers

Grinnell in Prison Program   **Grinnell, IA**
Instructor   2009-2010
- Planned and taught courses for incarcerated individuals
- Designed syllabi for courses in playwriting and short stories

PRESENTATIONS, EVENTS, WORKSHOPS
- *After Disruption : A two-part event exploring worker-centered futures and the rise/demise of platform systems,* with README and LA Cryptoparty, April 2019, Event Organizer & Workshop Facilitator, UCLA Broad Art Centre, Los Angeles, CA
- *My Face is My Own!: Helping Kids Beat Facial Recognition Software,* with README, workshop and zine for Processing Community Day, January 19, 2019. UCLA Broad Art Center, Los Angeles, CA
- *A Brief Guide to Your Technological Liberation,* with README, poster presentation and zine for Visions of Justice & Liberation, May 18, 2019. UCLA Campbell Hall, Los Angeles, CA
- *Linocut Printing Workshop* for Horn Press, May 20, 2018. UCLA Broad Art Center, Los Angeles, CA
- *Spring Sympozium: Collectors, Collecting, the Afterlife and More!,* Organizer and Director, April 8, 2016. Vacant Farm, Kansas City, MO

PROFESSIONAL ORGANIZATIONS
README @ UCLA – Organizer and Member
Society of American Archivists – Member
Association for Recorded Sound Collections - Member
Association of Moving Image Archivists – UCLA Student Chapter Member
Horn Press – Member

SKILLS
Archives: Experience working with ArchivesSpace; EAD and DACS compliant finding aids
Technology: WordPress, Microsoft Office, Adobe Suite, Photoshop, extensive experience with both Sirsi and Voyager library management software, coursework with digital asset management systems; XML encoding, some coding experience with Python
Media/design: film and video digitization, printmaking, graphic design, experience working with wide range of audio/visual formats
Language: German – some reading/conversational comprehension; Hebrew - some reading comprehension

Supporting Material

Digital Methods Final Project Overview
Ariel Hahn | Asa Wilder

Imperial Eyes is a digital humanities project designed and created for Professor Johanna Drucker's *Digital Methods for Research and Scholarship* course in fall 2018. Throughout this course I was exposed to a range of new digital tools and methods which I utilized to build a single, cohesive narrative project. In creating this project, I learned how to extract data using an API, use XML and JSON schema, build a website using a static site generator and a range of other valuable skills.

"Imperial Eyes" was a co-creation between myself and Ariel Hahn. I relied heavily on her prior skills and knowledge to guide me through many of the project's technical hurdles and challenges, and I am grateful for her introducing me to github and Jekyll. The following document is a final summary that details our approach, methods, and possible future plans for this experiment.

Imperial Eyes

Project Statement

Imperial Eyes (https://aireuhl.github.io/i_e) uses digital tools to engage with the ideological, physical and geographic creation of the United States. Through a side-by-side visual analysis of historical maps, and a textual analysis of land acquisition treaties, we ask: how did the acquisition and theft of land by European colonizers influence the way the continent was conceived, envisioned and mapped? What can the visual qualities of maps tell us about the role cartography plays in the larger development of colonization? Additionally, using digital tools to draw out deep, hard-to-decipher patterns, we attempt to answer questions about how government treaties helped shape the way land and space were visualized by early cartographers of the American continent. By creating a navigable timeline of maps and treaties, we hope to offer a deeper understanding of the way space is visualized in relation to political circumstances and cultural assumptions. Using a series of 39 historical maps from the New York Public Library's "Maps of North America" Digital Collection, we offer the beginnings of a larger project aimed at recontextualizing the evolution of mapping in America. Paired with interactive text and network analysis of contemporaneous treaties with indigenous peoples, these visualizations encourage digital learners to locate slippery and easily lost historical patterns in an effort to better understand the complex interplay of power, geography and visual representation. This project represents the beginning stages of a much larger-scale endeavor, which unfortunately is beyond our current capacity. We believe that more meaningful and interesting analytics could emerge through further harnessing the power of GIS data and building more links between these two robust categories of data.

Methods and Rationale

Imperial Eyes employs multiple complimentary digital methods to build a cohesive and meaningful display and analysis of visual and textual data. First, using textual analysis tools Voyant and Recogito, we assessed our initial dataset of 30 full-text treatries through informed distance reading and taggable event/person/place mark-up. The text of each treaty within our dataset was scraped from the web by hand and placed directly into an individual .txt file. After the initial readings of and engagement with our textual data, we were able to identify and build a more diagrammatic dataset of names, treaty titles, party information, dates and locations. This data model allowed for a deeper network analysis of 7 randomly selected treatries within our set, and pointed to overlapping data points (or edges), such as tribal members or United States government officials that were signatories to multiple treaties. Moreover, by geocoding the location names using LatLong.net for this sample, we were able to visualize the geographic relationship between treaty locations. After building our data model and going through multiple iterations of data clean-up in both Google Sheets and OpenRefine, we initially

attempted to visualize our .csv dataset through Gephi and Cytoscape. Ultimately, we elected to finalize our network analysis using the visualization software in Palladio. Though the export function within Palladio is not ideal (only a JSON file), this particular software had the lowest learning curve with regard to ingest and provided highly accessible visualizations that are both clear and comprehensive.

To develop our image collection and corresponding dataset for the maps, we again relied on a wide array of methods. We used the NYPL's API to download a set of .xml files in MODS 3.4 schema. A simple Python script was written to scrape these files and download the linked image files. The image metadata was then combined and cleaned in OpenRefine and reformatted into a .csv with a new data model. This data model provided deeper comparative analysis (such as filtering/organizing maps by date or language) and allowed us to add links to the treaty data. By aligning certain fields (date) between our two datasets (treaties and maps), we were able to combine them into a singular visualization in our timeline using Timeline JS .

Moreover, we also offer the beginning stages of a more advanced layer of computer-aided visual analysis. To measure the color, hue, brightness, shape and saturation of each map we used ImagePlot, a suite of high-powered visual analysis tools powered by ImageJ software. The use of computer vision software allows for rapid, large scale visual analysis of dozens of images at the same time. Using this software, we visualized a portion of our dataset using just the images themselves. Through the visualization of large sets of collected images, patterns and trends can begin to emerge that may reveal otherwise overlooked phenomenon.

Community

This project is primarily designed for the academic study of the history of settler colonialism in the United States. Motivated by a desire to highlight the often ignored historical contingencies of our contemporary political moment, we hope to engage historians and geographers in a wider discussion of the hidden ideologies behind mapping. In its current state, many of our tools are only marginally useful, but with a growing dataset, we are confident more interesting and novel patterns would emerge. These patterns could be useful to students and researchers interested in the intersection of cartography, visual cultural and political science as well as those working across indigenous and native studies, critical geography and information science.

Imperial Eyes was built and designed by two settlers of European descent. Asa Wilder is a third generation American who grew up in traditional Osage territory. Ariel Hahn is a fifth generation Arizonan and descendant of colonial-era settlers who was raised in traditional Tohono O'odham territory. They both currently reside in traditional Tongva territory and are interested in interrogating their participation, both familial and personal, in settler colonialism.

Design

The digital presentation component of Imperial Eyes is a website comprised of two primary sections: one, a comprehensive timeline and, two, a series of visualizations and associated analysis. Additionally, we've included an introductory homepage, a comprehensive next steps page highlighting the potential future of our project, and an about page with information on us as individuals alongside resource links. On the home page, users are met with our custom-designed title/logo as well as a project summary, brief description of our data, and a territory acknowledgement. From here, users can navigate to the interactive, detailed timeline with embedded images and linked text files. The timeline contains records for each of our 39 maps and our sample of seven treaties, including the date issued, names of creators, physical descriptions and a detailed, large-scale image. In addition to the timeline, the second section of our project features a gallery of visualizations and images of analysis tools used to process our data. Users are able to explore the textual datasets of our research through visualizations provided by Voyant and Palladio, highlighting the lingual, networked nature of our data. Then, users can see images of a prototype for an interactive GIS-linked interface. These images, including an animated .gif, demonstrate the possibilities of using warped map images as .kml files in a GIS interface such as Google Earth. While Google Earth has disabled its API and embedding functions, future possibilities for this kind of project remain. Finally, users can choose to navigate through a gallery of ImagePlot map visualizations. These visualizations order, sort and arrange the maps according to predefined specifications such as hue, color, brightness or date issued. The Imperial Eyes website is designed for both directed, narrative storytelling through the timeline and more open, non-structured exploration through our gallery of descriptive analysis and mapped/networked visualizations.

Technical Specifications and Workflows

Our set of digital assets include .txt files, .csv files, .jpg images, and .kml files. Our .txt files have been created by scraping text off of the web, both manually and through a Python script. Our map images are high quality .jpgs downloaded from the NYPL Digital Collections using a targeted API query. Our .csv files for both sides of the project (maps and treaties) were compiled, cleaned and edited using OpenRefine and Google Sheets. Using ImagePlot, an open source image processing and visualization tool, we produced a series of additional, original image files, as .jpgs. The warped map images used in Google Earth were produced and exported using NYPL Map Warper project. After rectifying each map by assigning multiple linked geo-codes, the .kmg file was produced and exported to Google Earth. To publish these visualizations through the web, screenshots and one animated .gif were produced.

Metadata:

Since this project was small in scope and somewhat iterative in practice, we did not stick to a single metadata infrastructure. Our data models evolved as we experimented with various visualization software until we created satisfactory visualizations. For our map metadata, we relied on the fields created by NYPL's API, which we originally downloaded as .xml Files in MODS 3.4 schema. Initially, we retained MODS date, name, size and location metadata standards. Image-naming was later altered to allow for interoperability with ImageMeasure and ImagePlot. For our treaty data model, our categories we designed for the specific purpose of visualization. We did add a few LOC Name Authority files to our network analysis data, though they were only available for United States authority figures. In our initial search, there were no authority files for any of the native signatories present within our treaty sample.

Digitization standards and workflow:

- NYPL Map images originally digitized as "High Res Tiffs" (2560 px).
  - Physical description of original maps (size and number of composite parts) documented in full maps dataset and on timeline
- .jpg derivatives (1600 px) downloaded for ImagePlot and ImageMeasure processing.
- These .jpgs were then cropped and edited to remove excess border space and rulers.
- Settings for ImagePlot visualizations are highly adjustable and customizable depending on the amount of images included in final image.
- Since sample of treaty images is small, they were downloaded individually and then uploaded to our Google Drive and made public for Timeline JS. A few additional images were manually uploaded to our CMS/Jekyll for use on our website.
- Digitized files of the *Indian Affairs: Laws and Treaties* as evident in our timeline are high-resolution .jpgs, 730 by 900 px at 600dpi.
- Digitized files of original treaties vary in size and resolution with the highest quality being a downloaded image from the National Archives which is 2204 x 3840 px at a less-than-archival 250dpi.

Analytic tools summary and workflow:

- Extracted text from web into individual .txt files, future instantiations of this project would hopefully automate this step through Python.
- Ran .txt files through Voyant and Recogito to perform distance reading and explore taggable event/person/place mark-up.
- Translated elements of .txt documents to .csv using Google Sheets.
- Created an initial data model and cleaned data in OpenRefine.
- Ran .csv file through Gephi and updated data model without success.
- Ran .csv file through Cytoscape and updated data model. Built a network but was not satisfied with visual result.

- Updated and greatly simplified data model. Ran .csv through Palladio, saved JSON file for potential future use and took screenshots of all network visualizations.
- Used NYPL API interface to extract .XML files of map metadata.
- Composed a simple Python code and scraped .xml files for image links.
- Downloaded and renamed .jpg files to allow for ImageMeasure analysis.
- Ran images through ImageMeasure plugin for ImageJ.
- Added resulting visual measurements to .CSV file and converted back to .txt.
- Used .txt measurement file to produce new visualizations with ImagePlot plugin.
- Used Map Warper to rectify and mark geolocations on historic map images.
- Uploaded .kml files to Google Earth instance and saved in "My Places" folder.
- Attempted to render dynamic visualizations of map layers through recorded "tours."
- Downloaded Timeline JS data model .csv and added map data as appropriated. Uploaded .csv to Timeline JS. Produced initial interactive timeline and upload as an iframe to CMS.
- Added treaty data and created additional descriptions in .csv. Timeline JS automatically updated as did the interactive timeline within our website.

Interface and infrastructure summary and workflow:

Our front-end interface uses Jekyll liquid templating shaped by Forestry.io's block front-matter. Jekyll is a static-site generator that creates easy-to-program blogs and websites. The code is served through and assets held within Github. We experimented with several possibilities – other Jekyll templates, Omeka, Wordpress – before settling on Forestry's CMS. Unlike other Jekyll templates, Forestry can be programmed through your command line, the Github interface, and their own well-designed CMS. This made sense for our project as we were interested in working with code but do not have the technical capacity to create a site on our own, end-to-end.

To build the site, we forked a Forestry.io repository (uBuild) and linked each of our Github accounts with the Forestry CMS page. We experimented with a few Forestry templates, and even did a trial-run where we created all of our own front-matter, before choosing uBuild. Within Forestry, we updated our config.yml and began adding and experimenting with their pre-programmed block-templates. This required us to create each page independently and copy over recurring elements like our navigation and footer each time.

We encountered a few errors throughout the process but were able to fix most issues within the code directly from Github. In terms of shaping the content of our visualization and timeline components, we did the following:

- Exported or embedded necessary visualizations into our CMS/interface after downloading them directly from our software of choice.
  - ImagePlot renderings exported as .jpgs and loaded into our Github repository.
  - Palladio renderings captured through .png screenshots.
  - Voyant and TimelineJS captured through embeddable iframes, which we added directly to our CMS after experimenting with a few workarounds.

- ○ Google Earth renderings captured through .png screenshots.
  - ○ Embedded maps and treaty images as .jpgs.

We also attempted to use ImageJ's built-in export/embed functionalities to integrate interactive visualizations in HTML.In the end, the embedding function too buggy for implementation. We complemented our visuals with alt-text to make it as accessible to audiences with limited or zero vision capacity or those interested in engaging with our descriptions in addition to the direct images. The site features no audio or sound video so it is accessible to individuals with limited or zero hearing capacity. Future iterations will also include a search function to provide further access to those who do not engage with the web through scroll and cursor-based exploration.

Sustainability

- To insure the sustainability of our code, we rely on Forestry and Jekyll remaining stable/supported. We can download our code and possibly use the Jekyll liquid templating through our own server in the future should Forestry or Github cease to operate.
- To scale up the project, the current workflow for incorporating new map images and further treaty text needs to be simplified and more automated through Python scripts or other command-line requests.
- A more automated way to ingest content into the data model could eventually be worked into the standard digitization workflow for maps as well as treaties.
- Institutional partnerships offer a promising future for the sustainability of Imperial Eyes:
  - ○ This project would greatly benefit from a partnership with an institution that houses a large collection of historical maps or treaties.
  - ○ Expanding the project would also introduce new voices into our discussions regarding how we model our data, what constitutes as data violence, and what tools make these materials most engaging and accessible.
- The obsolescence of Google Earth's API has already affected the ability to embed functionality as planned. This may happen to the other programs, like TimelineJS and Voyant, that we have embedded directly. It would benefit the project to find a long-term, archival solution for these visualizations beyond screenshots or video screen capture.
- As size and scope of the project increases, Github will no longer be able to function as a viable asset management system. Thinking about other digital asset management systems would be critical to ensure the projects longevity and growth.
- Our TimelineJS plugin relies on images stored in a Google Drive account (this was not initially our plan, but we could not find a way to interface the timeline plugin with files stored in our github repository).
- Creating workflows for data migration would be key to this project's future success. As it stands, we have the capacity to download our repository to our individual computers in addition to leaving it on Github. Another instance of the updated folder would be useful for archival purposes.
- The digital labor required to maintain this project poses perhaps the greatest obstacle to its continued growth and longevity. Without a stable and reliable funding model, the continued labor necessary to scale up this project is likely untenable. While this initial build did not require a budget for digital

asset storage, website design/maintenance or hosting, we recognize that these activities require substantial resources and pose a challenge moving forward.

Summary

Due to time and resource constraints, we are limited to including only a small portion of the land treaties and maps produced during the time period in question. A larger, more in-depth project would build off of this initial set to include not only maps of the whole US or continent, but also more focused and detailed maps of specific local areas, of which there are many more in NYPL's collection. Moreover, by linking the historical maps to geocoded data on contemporary maps, future instantiations of this project could be used to analyze much more minute, and localized historical changes in land visualization and mapping. Ultimately, the goal would be to link the warped map images to the location and network data contained in the treaty data model. This would allow for a single, centralized interface for all of our data and images.

In its current instantiation Imperial Eyes is a prototype and working model for a much larger and more labor-intensive digital project. One of the major limitations to image analysis software such as ImagePlot is that it requires a huge collection of images to produce interesting and insightful data. With only 39 maps in our image collection, the analytics produced by the program do not produce very interesting or meaningful visualizations. Additionally, the treaty text sample in our network visualizations was equally small. A larger sample of adequately modeled treaty data would better interrogate many of the questions we have when engaging with these materials. With a more comprehensive network analysis, it would be easier to see the gravity of how treaties impact they way the United States as we know it evolved. We could see what United States representatives were engaged in the creation of multiple treaties across decades or with multiple tribes, as well as what tribes and specific tribal members were present when the shape of their territory was reduced, moved or shifted by the will of the United States government. Future explorations of these materials would also be complemented by a visualizations and analysis paired with the geo-coordinates we collected.

Beyond the limitations of our current datasets, we also encountered issues with our CMS/Interface that would need to be remedied before continue with the project. Though our Forestry/Jekyll hybrid offers a ready-to-go, code-heavy html website, it doesn't appear to have an accessible .css file to manipulate things like font or padding between content blocks. It is also difficult to build a website based on someone else's template and contend with the legacy data that will sit and, for lack of a better term, rot within your repository. Despite these few issues, we found our chosen repository to work the best for the current needs of our project.

Appendices

Rights Statement:

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- No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

All treaty images and treaty text are historic government documents and are within the Public Domain. All of the historical map images used in this project were obtained through NYPL's digital collections and were labeled as Public Domain. After initially searching for all maps of North America, the results of the API query were modified to only contain public domain images. Each image is published with the following rights statement on the NYPL website:

> The New York Public Library believes that this item is in the public domain under the laws of the United States, but did not make a determination as to its copyright status under the copyright laws of other countries. This item may not be in the public domain under the laws of other countries. Though not required, if you want to credit us as the source, please use the following statement, "From The New York Public Library," and provide a link back to the item on our Digital Collections site. Doing so helps us track how our collection is used and helps justify freely releasing even more content in the future.

Data Provenance:

- Map images and metadata downloaded from NYPL digital collections.
- Warped map .kml files produced and exported through NYPL's web-based Map Warper interface.
- All ImagePlot visualizations are original images produced using the ImageMeasure and ImagePlot plugins for ImageJ, an open source visual analysis program.
- Treaty .txt files were scraped from Yale Law School's "Avalon Project: Documents in Law, History and Diplomacy."

- That online text was transcribed from the multiple volumes of [Charles Joseph Kappler's](#) *Indian Affairs: Laws and Treaties*, a bound collection of United States governmental laws and treaties with Indian nations that stem from the beginning of this country.
- Images for our treaties are a combination of digitized pages from Kappler's text and actual digital scans of original treaties, gathered from online digital collections and exhibits by the National Archives, University of Wisconsin-Madison, Beaver Area Heritage Foundation, and Oklahoma State University.

Additional Sources:

- Cultural Analytics Lab**:** http://lab.softwarestudies.com/p/cultural-analytics.html
- ImageJ: https://imagej.nih.gov/ij/
- Google Earth Pro: https://www.google.com/earth/versions/
- NYPL Map Warper: http://maps.nypl.org/warper/
- NYPL Digital Collections API: http://api.repo.nypl.org/
- TimelineJS: https://timeline.knightlab.com/