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## RESEARCH

# Prototyping the Archival Ephemeral: Experimental Interfaces for the Edwin Morgan Scrapbooks

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This paper introduces two digital prototypes, the Colour Collage and the Constellation visualizations, which we developed to represent eight pages from the scrapbooks of Scottish Poet Makar Edwin Morgan (1920–2010). We understand these prototypes as experiments within our research through design process, rather than as stand-alone digital objects, and so this article presents the theoretical pursuits and design decisions that motivated, and were motivated by, these prototypes. We begin by establishing our theoretical framework, which focuses on the roles of inscription technologies in archives and is guided by Bruno Latour's concept of a mediator (1993). We then discuss scrapbooks as polyvocal and hybrid mediators, which are nonetheless often pushed to the fringes of reading practices and material histories. In unpacking the fringe status of the Morgan scrapbooks in particular, we outline the copyright restrictions that complicate their digital publication. Reconceptualizing these restrictions as creative constraints, our prototypes experiment with forms of representation that go beyond the facsimile, drawing on detailed metadata and generating new visualizations that are inspired by the scrapbooks' materially-specific grammars. Our aim with these prototypes is to open the scrapbooks to new forms of play and discoverability in online contexts, while using digital tools and methodologies to better understand the scrapbooks' multifaceted modes of meaning creation. We conclude by discussing some of our prototypes' limitations, as well as future directions for our research through design process for the Morgan Scrapbooks.

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**Keywords:** Prototypes; Archives; Scrapbooks; Collaboration; Interdisciplinary Research; Copyright; Edwin Morgan

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## Introduction

Our paper and our project are broadly concerned with the ways in which meaning is mediated through inscription technologies, whether analog or digital. This paper will introduce two digital prototypes that we developed collaboratively to represent

an eight-page subset of the scrapbooks of Scottish Poet Makar Edwin Morgan (1920–2010). However, we begin by first setting out the theoretical frameworks that contextualize our concern for the roles of inscription technologies in archival collections, as well as some of the copyright concerns surrounding artifacts like the Morgan scrapbooks, in order to introduce our motivations for creating the prototypes in the first place.

### **Mediating bodies of knowledge**

At their most familiar, archives can be understood either 1) as collections of records that recount, interpret, and create meaning or 2) as places in which such collections are kept. However, as media studies, book history, and other similar fields show, the *how* of an archive is at least as important as the *what* and the *where*. Jacques Derrida famously asserted in *Archive Fever* that “the technical structure of the archiving archive also determines the structure of the archivable content even in its very coming into existence and in its relationship to the future. The archivization produces as much as it records the event” (Derrida 1998, 17). In other words, the various inscription technologies, whether visual, written, archeological, digital or otherwise, that comprise an archive do more than simply enable the recording and creation of meaning. Rather, the very meanings that an archive enables come into being through an entangled feedback-feedforward loop of influence—what N. Katherine Hayles has termed a “technogenetic spiral” (Hayles 2012, 104)—wherein technologies and humans interact to shape what is sensible, knowable, and archivable in the first place. Thus, what we archive and how we archive merge, making relevant a third definition of archives: as collections of inscription technologies and the meanings they bring into being. Moreover, far from being stable, a user’s access to, and understanding of, the meanings that are made possible through an archive’s inscription technologies will change as the personal, legal, and physical relationships to these technologies, and the media ecologies within which they exist, also change.

We argue that archives and their inscription technologies are productively approached through Bruno Latour’s concept of a mediator. For Latour, mediators are material entities that actively “transform, translate, distort, and modify the

meaning or the elements that they are supposed to carry,” therefore demanding that “their specificity [...] be taken into account every time” they are encountered (Latour 2005, 39). In language that resonates with Derrida’s focus on events in the archive, Latour argues that a mediator comprises “an original event [that creates] what it translates as well as the entities between which it plays the mediating role” (Latour 1993, 78). The meanings and connections that any one mediator is able to relay therefore arise in part because of the mediator itself, and this remains true of each mediator that a meaning or connection relies on. While mediators are unique and transformative, then, they never speak alone.

Archives actively demonstrate this networked power of mediators, as each record or object in an archive represents a host of social, cultural, political, and historical connections, which are then brought together into a new collective network produced by the creation of the archive, not to mention the networks within which the user exists. To introduce a new mediator, as with the addition of a new record to an archive or the development of a new inscription technology, is to introduce a new event that rhizomatically distributes itself through the networks that contributed to that event. While all materiality in any form is therefore a mediator, the legibility of mediators and an individual’s awareness of them necessarily exist in a constant state of change driven by these new events.

An effect of this state of change is that a mediator can be rendered invisible if it becomes too familiar, as occurred frequently, for example, with print inscription technologies for much of the twentieth century. Print objects became so ubiquitous that readers could comfortably ignore the mediating effects of the page, turning print inscription technologies into what Latour has termed an “intermediary”, or a material entity that is thought simply to transport meaning without transforming it (Latour 2005, 39). As soon as an active mediator is reduced to a passive intermediary, it becomes something to be seen through and, often, a shift in the mediating network is required to reaffirm its mediating role. Hayles elucidates exactly such a reactivation, or a *re*-mediation, of the networks of print when she argues that digital processes, such as, for example, digitization and Optical Character Recognition

programs, performed on printed texts show that “to change the material artifact is to transform the context and circumstances for interacting with the words, which inevitably changes the meanings of the words as well” (Hayles 2002, 23–4). An act as seemingly simple as producing a digital facsimile of a text shifts and adds to the technical structures of that text, changing the media through which it can be read, the functions which it can perform, the networks in which it can participate, and introducing a point of contrast between the original medium and that of the remediated object which can reaffirm the mediating effects of both. Neither treating a mediator as an intermediary nor remediating an artifact are ever therefore neutral acts.

While dominant mediators that have been treated as intermediaries, like print books, can be defamiliarized and reactivated by new or newly competitive technologies, such as occurred with the wide-spread introduction of digital mediators, this is not the only way that an invisible mediator can be reactivated. Mediators can also be reactivated in more subtle ways if attention is paid to other, less familiar and often materially marginalized mediators that deviate from a habitual and routine meaning-making practice. By complicating and defamiliarizing the practice of linear reading, for example, many experimental texts, artists’ books, and scrapbooks showcase the impact of their material specificity on their readers and become reinvigorating reminders of the impact of the print medium more broadly. Given the remediating capacity of these defamiliarizing texts, our paper takes up a concern for a particular collection of ephemeral and vulnerable archival artifacts, that is, the Morgan scrapbooks.

Scrapbooks like Morgan’s have often found themselves on the margins of archives, archiving technologies, and archival legal issues alike, and so exist as vulnerable bodies of knowledge. Ellen Gruber Garvey discusses how the homemade and “scrappy” presence of scrapbooks can make them appear “too common and trivial to be worth saving”. She continues, saying that “[a]s literary works, scrapbooks proclaim their noncanonical status as the poor relation of the published anthology”, which, as Garvey argues, is “already a disparaged category” (Garvey 2012, 210–11). Even

if scrapbooks are recognized as valuable and become archived, their ephemerality, fragility, and non-standardized materiality often makes them difficult to categorize, catalogue, and preserve, and so can decrease their visibility within an archive (Walkley 2001; Kuipers 2004; Hebert 2015). They may be too fragile for handling, they may not fit standard scanners that could be used for digitization, and standard preservation methods may not be adequate to prevent material degradation of the many materials contained in a single volume. Finally, as copyright law has evolved since the nineteenth century, forms of fair use, reuse, and remix have become entangled with, and often strangled by, efforts to protect rightsholders. As Rosemary Coombe et al. argue: “the rights created under copyright law often obstruct what they are traditionally designed to enable: fair access to cultural expressions, with the aim of encouraging innovation and creativity to the benefit of society at large” (Coombe, Wershler, and Zeilinger 2014, 4). While such obstructions have always had negative impacts on recombinant texts like scrapbooks, the situation has become particularly dire in the context of our current archival media ecologies, wherein the online discovery, description, and access of cultural materials is vital to their continued life. Although copyright does not prevent texts like scrapbooks from being archived, as soon as they are digitally reproduced through facsimile, the burden of third-party copyright restrictions is activated and has what Coombe et al. refer to as a “chilling effect” on cultural exchange and continued use (Coombe, Wershler, and Zeilinger 2014, 4). In many cases, the weight of due diligence and risk combined with the marginal status of scrapbooks often ensures that they are simply passed over in digitization projects.

While the vulnerability of scrapbooks within an archive brings to light some of the many, often invisible, forces, such as the limitations imposed by physical shelf space or the legal power of copyright, that shape what materials can be found, accessed, and interpreted, these issues are not wholly unique to scrapbooks. All archival materials are impacted and variously empowered or marginalized by these networks of mediating actants; scrapbooks and other vulnerable bodies of knowledge simply make these relationships more visible. When discussing pasted-in albums inherited

from his mother in his essay “Unpacking My Library”, Walter Benjamin states that “there is no living library that does not harbour a number of booklike creations from fringe areas” and he observes that these hybrid texts “form the prismatic fringes of a library” (Benjamin 2007, 66). It is precisely due to this prismatic quality—an ability to reflect and refract their own mediating networks—that we argue for hybrid artifacts to be approached on their own terms in order to inspire dynamic play and to encourage new perspectives on both print and digital mediators. In particular, our work with the Morgan scrapbooks experiments with how visualization tools can help to make these scrapbooks newly legible in online contexts, while simultaneously unpacking how the scrapbooks encourage creativity and innovation in the visualizations used to represent them digitally. In the following section, we discuss the technological and legal issues facing the Morgan scrapbooks, including complex issues of copyright, before then detailing our collaborative research through design process and our development of two playful prototypical interfaces for the scrapbooks in subsequent sections.

### **Edwin Morgan Scrapbooks: Technological and legal constraints**

Morgan’s scrapbooks span 16 volumes, roughly 35 years, more than 3600 pages, and more than 54,000 individual visual and textual items. These items are extracted from both mass media sources and more personal sources, such as letters, photographs, tickets, and Morgan’s own drawings. Morgan started curating his scrapbooks around 1931, when he was only eleven years old, and continued until about 1966, when he was well into his forties and becoming known as an established poet, not to mention as an “academic, cultural activist, radical writer, international traveller, gay man”, critic, and professor (Sandstone Press, 2015). The scrapbooks are both social documents, archiving cultural and political moments contemporary to Morgan, and spaces of personal identity formation, where Morgan could, for example, performatively express his identity as a gay man during a time when this identity was still illegal in Scotland or grapple with the ways in which his general optimism about technology confronted his distaste for, and anxieties about, war across both

the Second World War and the Cold War. Demonstrating a keen sense of narrative juxtaposition, numerous examples of collage, and intricate aesthetic arrangements of clipped items, Morgan described his scrapbooks as a “mixture of autobiography, documentary, and art”, and he saw them as “very much a part of [his] ‘works’” (quoted in McGonigal and Hepworth 2012, 1). As such, Morgan twice tried to have his scrapbooks published, once in 1953 and again in 1988; however, his publishers rejected the project both times, due in part to the high cost associated with copyright clearance and colour copying (McGonigal and Hepworth 2012, 1–2). Morgan sold the scrapbooks to Glasgow’s Department of Special Collections in 1980, where they remain accessible today, catalogued as MS Morgan C1–16. Fifteen photographs of selected scrapbook pages have also been made available through the University of Glasgow Library’s Flickr page (see **Figure 1**), released in honour of Morgan’s 90th birthday in 2010 (University of Glasgow 2010).

As this history shows, and as Morgan himself recognized, the scrapbooks are archival artifacts in a doubled and overlapping sense: both as objects that themselves comprise a third-party archive, displaying, preserving, and de/recontextualizing



**Figure 1:** Edwin Morgan Scrapbook 11 (1953–55), pp. 2146–7. Image credit University of Glasgow Library, Special Collections in order to comply with copyright.

fragmentary information from contemporary ephemeral media sources, and as personal artifacts comprising a crucial piece of Morgan's own *oeuvre* and archive. In this doubled ontology, Morgan's scrapbooks are certainly not alone. Garvey argues that private scrapbooks, and their close cousins, including albums, commonplace books, and grangerized texts, are often created through processes of "perform[ed] archivalness", or, in other words, processes that represent "the will to save, organize, and transmit knowledge through a homemade archive" (Garvey 2012, 20). Far from being trivial, this homemade status often makes scrapbooks and similar inscription technologies available to marginalized people, such as women, youths, people of colour, and LGBTQ+ individuals, who have been, and in many cases still are, routinely denied access to mainstream publication (Weinberg 1994; Ford 1996; Tucker, Buckler, and Ott 2006; Garvey 2012; Gilger 2015). These artifacts can also preserve primary sources that in some cases do not survive beyond saved clippings in scrapbooks and allow for narrative and meaning-making experimentation in collage, non-linear narratives, and mixed-media. Scrapbooks are therefore prismatic in their polyvocality, democratic availability, and hybridity; however, as Morgan's publishers' decisions attest to, and as discussed above, their fringe status and ephemerality also makes them difficult to categorize, catalogue, and preserve. Furthermore, the very fact that these texts are often the work of marginalized people can and is used to denigrate and devalue them. Scrapbooks, for example, are often written off through their connections to feminine and domestic meaning-making practices as being trivial, sentimental, and juvenile (Mecklenburg-Faenger 2012). Consequently, scrapbooks are frequently overlooked and undervalued in material histories, despite all they have to offer.

With rapid advances in high-resolution photography and scanning, and the possibilities offered by digital publication, some of the technological challenges barring Morgan's scrapbooks from publication in the 1950s and 1980s have been alleviated, and certainly, scrapbooks are now being published, both in print, such as *Edward Bawden Scrapbooks* (Peyton and Webb 2016), and online, such as *Grace Hall Hemingway's Scrapbooks* in the John F. Kennedy Presidential Library and

Museum (2013). However, other barriers still remain. Scrapbooks are typically multi-modal, with media-specific and tactile mediators providing information about the clippings that cannot be communicated through a photographic facsimile, such as the matte finish and rough surface of pulp paper as opposed to a glossy magazine page. Moreover, modern issues of copyright persist even where technological barriers have diminished. The fact that Morgan neither owned nor consistently referenced much of the ephemeral material that comprises the scrapbooks makes clearing them through copyright difficult. The scrapbooks therefore become part of what librarians and archivists have termed the “twentieth-century black hole” of information, or the digital gap caused by printed material that is still in copyright, but is either without clear and/or reachable rightsholders or is too costly to clear through known copyright holders, and so is not currently available online (Boyle 2009; Gómez and Keller 2015).

While the twentieth-century black hole affects texts of all types, including printed book objects and periodical materials, the fringe status of scrapbooks exacerbates the problems of copyright. UK copyright law does not typically consider, for example, what Garvey terms a scrapbooker’s specific “language of juxtaposition” (Garvey, 2012, 207) as a form of authorship, despite the fact that this language guides the reader through the content and creates aesthetic provocations through the scrapbooks’ contexts. Moreover, unlike a single-authored print text, scrapbooks can hold thousands of individually sourced materials, making UK copyright due diligence requirements not only daunting, but actually prohibitive to the digitization of scrapbooks in many cases.

The full extent to which UK due diligence requirements come to bear on the Morgan scrapbooks has been assessed by Ronan Deazley, Kerry Patterson, and Victoria Stobo in a project titled *Digitising the Edwin Morgan Scrapbooks*. This landmark project worked to put thirty pages from Morgan’s Scrapbook 12 online, while also assessing the impact of two copyright schemes, the EU Orphan Works Directive and the UK Intellectual Property Office’s Orphan Works Licensing Scheme (OWLS), on the scrapbooks’ orphan works. An orphan work is defined as a work that

is in copyright, but for which a rightsholder cannot be identified or located (Deazley, Patterson, and Stobo 2017). Over the course of a year, due diligence was carried out by Patterson on the 432 clippings contained in the thirty-page sample. Of these, 52% were judged to be orphan works, and based on the due diligence work required for these items, the project estimates that “[t]he total cost [...] to make all orphan works contained in the [sixteen] scrapbooks available online would be £187,241.06 (including application and licence fees, and salary costs) and would take 8.2 years” (Deazley, Patterson, and Stobo 2017). Staggeringly, these estimates do not extend to the costs and time required for any items in the remaining 48% of the scrapbooks which are in copyright and for which rights holders are known, but still need to be contacted and/or paid. Overall then, *Digitising the Edwin Morgan Scrapbooks* reaffirms the “chilling effect” identified by Coombe et al. and forcefully proves that UK and EU copyright laws are not serving the needs of materials like the Morgan scrapbooks.

Despite these legal barriers, we argue that the highly visual, non-linear, and interconnected language of juxtaposition used in the Morgan scrapbooks is becoming increasingly relevant and legible in the digital age. For example, image-based sites like Pinterest use visual clipping processes directly inspired by scrapbooking to group, collect, tag, and hyperlink data. In fact, Garvey asserts that “scrapbooks are the direct ancestors of our digital information management” (Garvey 2012, 10), because many digital tools rely on what scrapbooks actively demonstrate, namely, “that pieces of information—whether in the form of articles, books, or snippets—are detachable, movable, and classifiable under multiple headings” (Garvey 2012, 235). In agreement with Hayles’s emphasis on the impact and non-neutrality of remediation, Garvey’s attention to the changing meaning of clippings in new contexts suggests that while digital mediators are improving the potential for new engagements with scrapbooks, scrapbooks simultaneously offer the chance to rethink some of the newly developed, yet nevertheless interconnected, digital mediators that exist in current media ecologies. This prismatic ability of scrapbooks to speak back and through digital media also creates new space for the materially-specific grammars of scrapbooks

to move from the fringes and become newly legible and relevant in digital media ecologies.

Based on our belief in the importance of the Morgan scrapbooks, as personal, social, and technological prismatic artifacts, our interdisciplinary, collaborative project uses the synergies and parallels between visual digital mediators and scrapbooks to take up the copyright challenge facing the Morgan scrapbooks as identified by the *Digitising the Edwin Morgan Scrapbooks* project. We approach the copyright restrictions as creative constraints, rather than barriers, and are seeking digital ways of engaging with the scrapbooks that do not trigger copyright restrictions. We do not attempt to replace or even reproduce the scrapbooks through facsimile—a task that would be doomed to fail even without copyright restrictions, as the media-specificity and multi-modality of the scrapbooks ensures that nothing digital can replace them. Rather, our project seeks to produce new creative digital mediators that are inspired by the scrapbooks and exist alongside them in order to make the information contained within them more discoverable and open to forms of play in digital contexts. Our next section details our decisions for how we approached the creation of these digital mediators and how we selected the aspects of the scrapbooks that these prototypes represent, interpret, and explore digitally.

### **Drawing inspiration: Research through design questions**

Our research through design process has been guided by a series of questions and explorations, which, we argue, reveal as much about our prototypes and the value of engaging in digital explorations of fringe mediators as the digital objects that we produce. By re-tracing our methods and decisions, we attempt to keep our process as transparent as possible, while also showing the ways in which we have come to understand aspects of the scrapbooks' particular modes of mediation. Our process illustrates how approaching a mediator on its own terms allows it to speak back to other mediators, such as catalogue records and indeed our own research tools, that might come to bear on its mediating networks. This section therefore outlines the main questions raised in our initial research process and discusses our approaches to them.

### **1. What recent digital projects and theories have addressed archival collections like the Morgan Scrapbooks? What lessons and inspirations can we draw from them?**

At every stage, our development process has been in conversation with recent theories and projects based on complex archival collections like the Morgan scrapbooks. We are particularly drawn to interfaces that allow for the intersection of multiple filters and search perimeters to produce simultaneous, parallel views of their data. For example, the *Bohemian Bookshelf* visualizes books from the University of Calgary Library through five interconnected visualizations, showing books grouped by cover colour, number of pages, author, timeline, and keywords, to facilitate the “serendipitous discovery” of books in the library (Thudt, Hinrichs, and Carpendale 2012). Similarly, the *Speculative W@nderverse* represents a previously untapped collection of early science fiction materials compiled and curated by Canadian collector William Robert (Bob) Gibson (1908–2001) through interlinked visualizations (Forlini, Hinrichs, and Moynihan 2016). These visualizations include a bubble diagram of Gibson’s own symbols, a timeline, a tag cloud, and a radial tree diagram of keywords, while also providing links to the fully digitized articles, images, and stories represented in the visualization. The *W@nderverse* therefore provides insight into the Gibson collection at a high level, showing the connections between the collection items, while also allowing movement between these high-level visualizations and the full-text data that allows for more detailed analysis. A third example can be found in the *Past Visions* project, which visualizes 1,492 sheets of drawings by King Frederick William IV of Prussia (1795–1861) along two interlinked dimensions of theme and time (Glinka, Pietsch, and Dörk 2017). *Past Visions* allows for filtering of the whole collection by selected theme(s), and also enables the user to zoom in to any individual drawing without altering the selected parameters, thereby enabling a fluid transition from distant to close viewing.

Influenced by projects such as the three discussed above, we are convinced by the power of browsing interfaces that resist simple search and retrieval tasks, such as those theorized through “generous interfaces” (Whitelaw 2015) and “rich-prospect browsers” (Ruecker, Radzikowska, and Sinclair 2011). Whitelaw explains that a generous interface moves beyond query-based searching in representing “the scale

and richness of its collection” (Whitelaw 2015, paragraph 3). Rather than a query field, generous interfaces provide “multiple ways in” to the collection, support “exploration as well as the focused enquiry where search excels”, and “enrich interpretation by revealing relationships and structures within a collection” (Whitelaw 2015, paragraph 3). Similarly, Ruecker et al. describe rich-prospect browsers as those that display “a visual representation of every item in a given collection, combined with tools for manipulating the display” (Ruecker, Radzikowska, and Sinclair 2011, 3). Thus, generous interfaces and rich-prospect browsers are attuned to the mediating networks of archival collections, while also seeking to better understand and utilize the mediating potential of the browser itself. As we expand upon in our second research question, Ruecker et al.’s approach to rich-prospect browsers is also relevant to our project given that they explicitly acknowledge the role of early prototypes in experimenting with, and pushing the boundaries of, browsers, especially in research contexts (Ruecker, Radzikowska, and Sinclair 2011, 8–9).

## ***2. What is the purpose of developing prototypes? What value do they have to us as researchers and what can they offer to other potential users/researchers?***

As with the projects discussed by Ruecker et al. our project is experimental and research-driven, rather than being motivated by a desire for a stable end-product. We therefore align ourselves with those researchers who recognize the research value created by prototypes, despite the necessarily less-polished status of the resulting digital object. In fact, we argue that prototypes share many of the same fringe characteristics as scrapbooks, including a sense of ephemerality, difficulty with preservation and categorization, and features that can exist at odds with dominant inscription technologies. However, just as with scrapbooks, the fringe status of prototypes can become prismatic. Alan Galey and Stan Ruecker offer an account of this prismatic capacity in their discussion of the ways in which prototypes can be “contestable, defensible, and substantive”, and, thus, capable of advancing an argument. (Galey and Ruecker 2010, 412). They assert, for example, that prototypes can contest through the affordances they either reshape or invent in their field or across disciplines, that they are defensible through the “heuristic evaluation” of these

affordances, and that they prove substantive over time through the “intellectual importance and practical value” of these affordances (Galey and Ruecker 2010, 412–13). By approaching prototypes in and of themselves as arguments, rather than simply as early stages of a yet-to-be-finalized tool, the often-overlooked, yet nonetheless prismatic, mediating value of these prototypes is brought to the fore (Hinrichs, Forlini, and Moynihan 2018).

Gabriella Arrigoni and Tom Schofield echo Galey and Ruecker’s conviction for the value of prototypes, arguing that prototypes “are provocative objects” that can “open up new directions or fields of exploration for design”, “instigate debate” and/or “support an investigation on people’s values and attitudes” (Arrigoni and Schofield 2015, 27). In other words, as new and novel inscription technologies, prototypes, whether paper or digital, are unfamiliar enough to make their status as mediators difficult to ignore. They assert the impact of their particular modes of meaning creation, while also remaining flexible and plastic enough to be adapted as users and researchers alike come to better understand the data that the prototypes mediate.

Thus, prototypes prove themselves to be more adaptable and dynamic in many cases than seemingly stable, and often more inert, large scale end-products. The ways in which prototypes shape-shift along a research process allows their various versions to become a form of archivization for the research process itself, offering exciting possibilities for research through design (Hinrichs, Forlini, and Moynihan 2018). The changeability of prototypes also aligns well with what Schofield et al. refer to as “archival liveness”, or a model that allows for “design interventions before or during the cataloguing and digitization process” in order to account more holistically for the dynamic nature of archives as they are “continually expanding, taken up in larger aggregations, being re-catalogued and described” (Schofield et al. 2015, paragraph 63). We therefore enter into our project fully embracing the experimental and prototypical nature of the interfaces that we are building, seeing them as new mediators that not only add to the mediating network of the Morgan scrapbooks, but that themselves also become prismatic and archiving artifacts within our research.

### ***3. What is the aim of our interfaces and what aspects of the Morgan Scrapbooks can we best remediate and explore through them?***

To define the goal of our prototypes, we first worked with the scrapbooks themselves to learn about their specific grammars and meaning-making practices. We interacted with the scrapbooks in the reading room of the University of Glasgow Library, Special Collections, taking notes and sketching many facets that struck our attention, such as the tactility and topography of the pages and the ranges of colour, shapes, sizes, and counts of clippings that occur page to page and book to book. The Edwin Morgan Trust and the University of Glasgow Library, Special Collections also generously provided us with access to high-resolution double-page photographs of pages from Scrapbook 9 and 12. The digitized facsimiles allowed us to work with the scrapbook pages offsite and to compare the experience of the physical scrapbook page to that of the digitized facsimile page. We determined that our data subset would include pages 2261, 2262, 2407, 2408, 2423, and 2424 from Scrapbook 12 and pages 1519 and 1520 from Scrapbook 9. These pages were selected due to the ranges of materials, colours, sources, and density of clipping coverage among and between these pages, thus allowing them to represent at least a snapshot of the diversity at play across the scrapbooks.

Zeroing in on these pages, our notes and sketches reaffirmed for us the richness of the Morgan scrapbooks and the many points of entry possible when approaching them through even a small subset of pages. We were struck by the fact that, given standard cataloguing procedures, the digital catalogue record, or what Greene et al. calls the “information surrogate” (Greene et al. 2000), for each scrapbook understandably provides information for them as whole book objects only, while details about the vast range of materials and topics included in the scrapbooks remain inaccessible to digital users searching the catalogue. We decided that we would therefore prioritize playful and generous interfaces that would allow uninitiated, albeit interested, users to gain an introductory grasp of the content and materials in the Morgan scrapbooks in greater, more nuanced detail than these

catalogue records can allow. We also decided that our interfaces would not be based on the facsimile pages, because, although we can feasibly ensure copyright clearance for our small sample size, *Digitising the Edwin Morgan Scrapbooks* proves that such an approach is not viable for the whole collection, making any interface based on facsimile reproductions of lesser value overall. We instead decided to focus on creating rich information surrogates in a relational MariaDB database that allows us to extract computational metadata, such as colour values, pixel size of image, and item coordinates from the facsimiles, as well as more traditional metadata, such as source, creator, medium, and date, for every clipping in our eight-page sample. We can then interpret and visualize this metadata through interactive interfaces.

As a result of these decisions, our aim with our interfaces is not to recreate the scrapbook pages, nor to represent them objectively, but rather to work creatively in a digital setting with the networks of mediators that both the scrapbooks and digital technologies bring into being. Our process therefore resonates with what Jessica Pressman has termed “digital modernism”, or a practice of “seeking inspiration and validation in a literary past”—a past which in our case manifests as Morgan’s arguably modernist scrapbooks—while simultaneously “renovating modernist aesthetic practices, principles, and texts into new media” in ways that “complicate simple designations of new” (Pressman 2014, 2). Our interfaces are not, therefore, a direct remediation of the archive of the scrapbooks, but rather a creative interpretation of, and a contribution to, this archive. We hope that by creatively interacting with the mix of traditional and computational data inspired by Morgan’s twentieth-century scrapbooks and enabled by our own twenty-first century database that we can offer new inroads for discovery to the ever-growing historical archive of prismatic mediators that surround and comprise the Morgan scrapbooks.

#### ***4. How can the complex legal statuses of these collections be reconceptualized as creative constraints instead of barriers?***

Thinking beyond the facsimile towards a mediated digital interpretation of the scrapbooks required us to think creatively about what types of metadata we would collect that would best support our exploratory and playful visualization goals. As

polyvocal mediators comprised of mediators, scrapbooks speak through a plethora of overlooked visual and material grammars, and many of these are not silenced by copyright restrictions. Rather than relegating these grammars to the far fringes yet again, we approached the Morgan scrapbooks with a conscious effort to attune ourselves to these grammars and to create new spaces wherein they can be given voice, whether or not facsimiles of the scrapbook pages are made public.

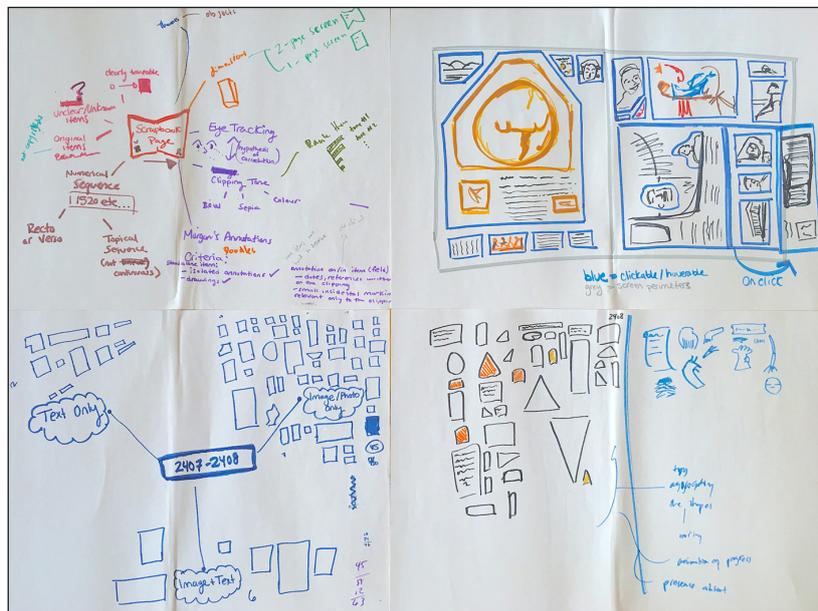
Although we considered focusing on the page as our smallest unit of meaning, or even individual clippings, we ultimately decided that we could offer the most nuance if we captured data that extended to the individual components of a clipping. By referring to a clipping's components, we reference the individual occurrences of images and text in a clipping separately, such as a photograph and a caption or an article with illustrating photographs. We argue that each component is important, as it impacts the overall gestalt of the scrapbook page and injects its own grammar into the language of the scrapbooks. Even something as simple as the difference between an uncaptioned photograph and a captioned photograph invokes different mixes of reading practices. To help represent the scrapbooks across their various units of meaning, then, our database filters our data through six main tables, beginning at the level of scrapbook, before then zooming in through page, clipping, and component, as well as collecting information in tables for clipping creators and clipping sources when known. Across these tables, our sample size created interrelated data for 167 clippings and 224 components collected across eight pages and two scrapbooks.

When building these tables, we included fields that would allow us to extract aspects of the scrapbook clippings and components, such as colour in the form of computationally extracted colour values, thereby ensuring that the materiality of these clippings has a presence in our data. Our tables also leave room for messiness in our data, allowing clippings and components that depict unclear images or are of an uncertain medium to be categorized as unknown or uncertain, rather than being excluded.

With this database populated, we created a base from which to experiment with visualization ideas that could represent this data. Inspired by the ways in which

scrapbooks (and clippings more generally) show how “pieces of information [...] are detachable, movable, and classifiable under multiple headings” (Garvey 2012, 235), we experimented with connecting, isolating, and referencing our database columns, fields, and rows to a range of effects. We used our collected data to sketch out potential representations of the data, sometimes using the pages of the scrapbook as visual inspiration, and sometimes departing from the page entirely to explore the data in a completely different context (see **Figure 2**).

Reconceptualizing copyright barriers as creative constraints encouraged us to explore the scrapbooks in a variety of computational and artistic ways and to develop means of capturing these explorations in our database. Engaging with the scrapbooks through these forms of metadata, rather than through a facsimile, also affirmed for us how a dependency on facsimiles or other digital surrogates can lead to the rich potentials of metadata being overlooked and underdeveloped. As Andrea Wallace and Ronan Deazley observe: “most cultural institutions have failed to take advantage of the benefits of metadata—or at least have only begun to do so in recent years” (Wallace and Deazley 2016, 5). The following section outlines the two most robust



**Figure 2:** Preliminary Collaborative Sketches Inspired by the Morgan Scrapbooks.

prototypes within our research through design process built from this captured and remediated metadata.

### **Prototypical interfaces**

The prototypes we discuss in this section are not stable endpoints to our research through design process, but rather steps within our process. We understand these prototypes as case studies that enable us to experiment with remediating specific aspects of the scrapbooks and to contribute to an increased and productively playful online presence for the scrapbooks. We discuss each prototype in this prismatic spirit of experimentation and play, and we provide active links to the prototypes that can be publicly accessed (it should be noted that these prototypes have not been calibrated for touchscreen use at this time and are best accessed through the Chrome browser on a desktop, rather than small screen devices).

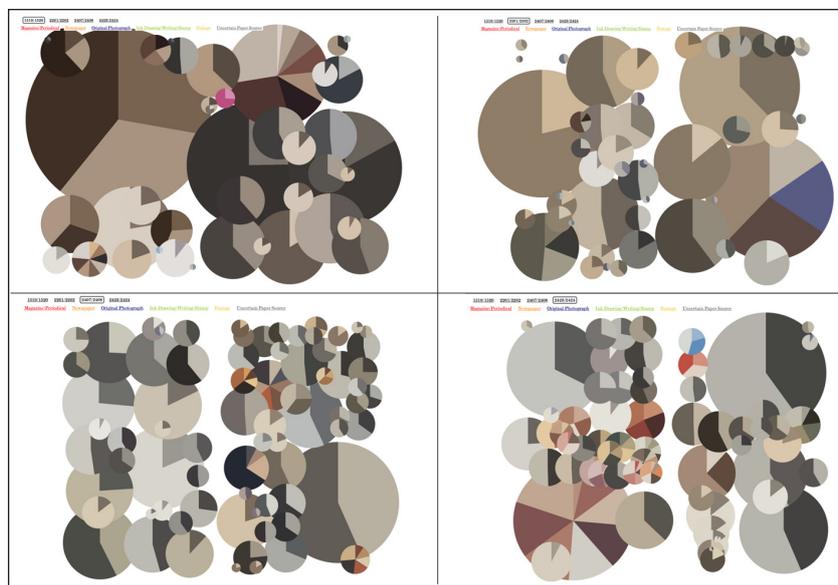
### ***Colour Collage***

Morgan was a talented artist in his youth, and almost chose to study art in university instead of literature (Morgan 1990, 93). The scrapbooks reflect his artistic skill, with several of the collages in the scrapbooks appearing so coherent that the seams of the clippings are almost invisible. Across the scrapbooks, Morgan also repeatedly achieves coherence through attention to colour, with black and white clippings being grouped, for example, to create grey scale pages that appear to speak as a unit despite their composite materiality. Morgan also plays with the density of clippings on various pages, sometimes focusing on two or three large clippings, and sometimes mixing thirty or forty small clippings on a page to create a mosaiced page effect. Given this attention to colour, size, and layout of the scrapbook pages, our first prototype works to explore visually how these elements shape the character of the pages in our subset. We call the prototype resulting from this exploration our Colour Collage visualization.

We began by interpreting each clipping component as a circle that accurately reflects the area of the various clipping components in pixels and we plotted the centre of each circle onto the centre coordinate of the clipping component that it represents. We then converted these circles into pie-charts that show the unique

colour values for each component, which are produced by a K-means clustering algorithm that groups a component's pixels into a specified number of colour categories based on the nearest centroid, and thus shows the dominant colours for each component. The number of colour categories in our dataset ranges from two for black and white components to as many as eight for full-colour components. The resulting visualization is an abstract, collaged representation of the scrapbook components as they appear on double-page spreads (see **Figure 3**).

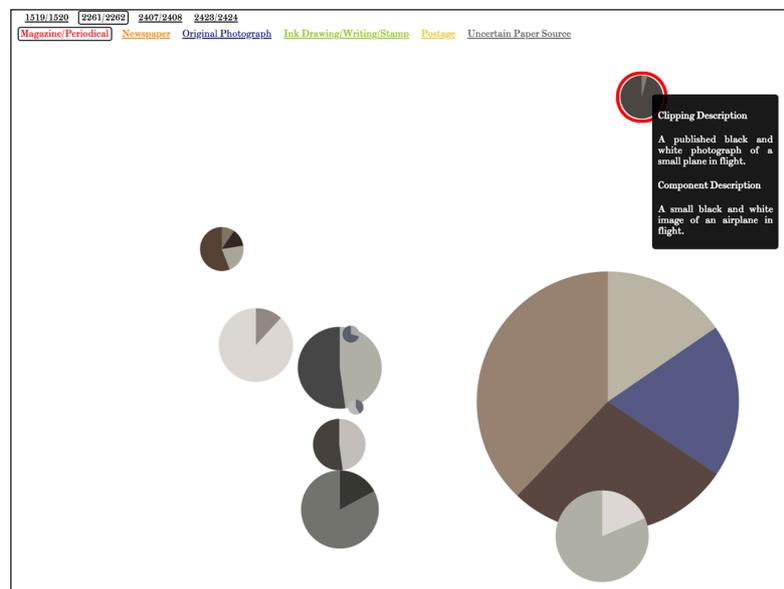
Once constructed, we used our colour collages as the basis for an interactive prototype. We built a php website through which users can interact with the circles and find out more about the components that they represent. Hovering over a circle will bring up a text-based abstract describing the component and the clipping, as well as a coloured 'halo' or ring around the circle, which corresponds to a colour-coded list of media sources that appears at the top of the page (Magazine/Periodical, Newspaper, Original Photograph, Ink Drawing/Writing/Stamp, Postage, Uncertain Paper Source). The colour of the halo therefore indicates the medium of the clipping for the selected component. Clicking on a component's circle in the visualization



**Figure 3:** Colour Collages Representing Double-Page Spreads from the Morgan Scrapbooks.

will cause its halo and abstract to stay selected and visible and clicking on the circle again will deselect it. Similarly, the colour-coded media list acts as a click-based filter. Clicking on any media type along the top of the page will filter the colour circles, so that only those affiliated with the selected medium appear (see **Figure 4**). Clicking the media type again will reset the filter. Above the media types along the top of the page, we also include page navigation buttons that allow the user to toggle between page sets and indicate which page set is currently being displayed.

The Colour Collage visualization therefore allows the scrapbook page to persist as a structuring element for the visualization and exploration of the clipping components in our subset. Rather than allowing the materiality of the page to become a footnote in an ekphrastic description of either the page or the clipping component, however, this visualization abstracts and defamiliarizes the aesthetics of the page in order to foreground component colour, size, and layout first. Textual descriptions are only provided to the user after they have experienced the initial gestalt of the visual interpretation of the page and have begun to mouse around the screen. This visualization therefore experiments with some of the ways in which



**Figure 4:** Screenshot Showing a Filtered View of the Colour Collage Visualization, Scrapbook 12, pages 2261–2262.

scrapbooks can attune their readers to non-textual grammars of meaning creation, as well as with some of the ways in which the presence of highly visual artifacts like the Morgan scrapbooks can be reimagined and remediated through means that do not rely on facsimiles.

As a generous interface, this visualization succeeds in providing information to the user without requiring prior knowledge of the collection or specific search terms. Instead, the visual information is offered immediately, while the textual information on the page is able to be discovered organically through exploration. However, we do acknowledge that this visualization does not allow the user to search for specific keywords or topics, therefore limiting some of its generosity. We also acknowledge that the overall structure of the collection at the level of the book is not communicated through this interface, but the structure of the page is maintained and represented, while still tapping into the media-specific possibilities provided by the digital, such as the ability to filter by medium, which can offer new and generous perspectives on the data not foregrounded by the physical artifact.

### ***Constellation visualization***

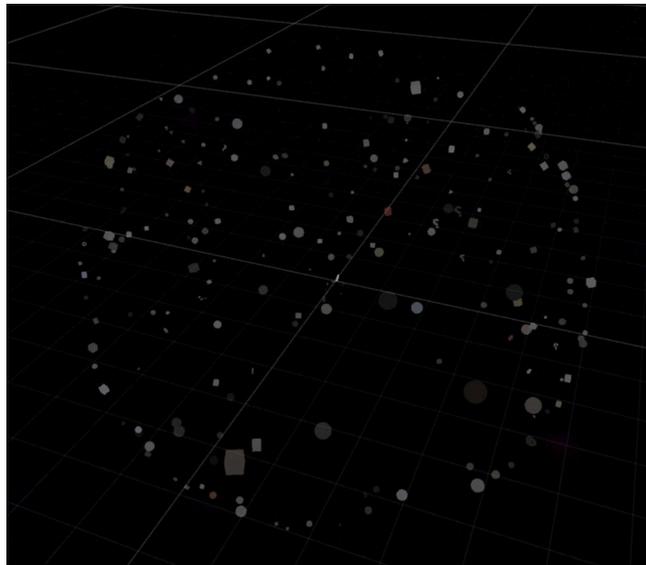
As a poet, Morgan is highly skilled in creating collections of poems wherein the individual poems themselves are dynamic and able to be read on their own, but nonetheless speak all the more powerfully for being part of a carefully curated collection. The clippings and pages in Morgan's scrapbooks undergo a similar intensification of meaning when read through their juxtapositions across the collection, rather than in isolation. For example, a reader of the scrapbooks can trace developments both in technology and Morgan's interest regarding space travel from the 1930s through the space race to the first manned space missions in the pages of the scrapbooks—an accumulation of meaning that is not able to be encapsulated by any one page. For our second visualization, we therefore decided to depart from the unit of the page, and to explore the connections that exist between and across clippings, pages, and books.

To enable this exploration, we conceived of a spherical, 360-degree, 3D environment that would allow the scrapbook components to be represented

collectively as objects within the space (see **Figure 5**). Every component in our subset is shown simultaneously in this visualization, which allows us to atomize the unit of the page and depart from the linearity of the sequenced books. We were particularly inspired by Morgan's science fiction poetry, and his pervasive interest in space as evidenced both across the scrapbooks and his poems, and so decided to project the objects representing the scrapbook components onto a celestially-inspired background that lends them the appearance of floating objects in space. Guided by this same inspiration, we call this prototype the Constellation visualization.

To create our Constellation prototype, we chose the game development platform Unity, using the C# scripting language and Microsoft Visual Studio to write the code. Not only did this platform allow us to create the 3D environment we wanted to experiment with, it also enabled us to implement simultaneous filters and grouping mechanisms to help manipulate the data.

When the Constellation visualization is launched, the user's eye-level view places them at the centre of the spherical environment (see **Figure 6**), with the objects distributed around them. The camera is directed by the user's mouse and moves left, right, up, and down, thereby requiring the user to engage with the interface in order



**Figure 5:** Zoomed Out View of the Constellation Visualization Framework.

to see all of the objects. The Constellation prototype experiments with a number of different aesthetic cues, which we outline below:

- Each component from our eight-page subset is represented as a geometric object in the visualization, which, in turn, represents a category of clipping, such as Original Photograph, Printed Text, and Postage Stamp (see **Figure 7**). It should be noted that we view these geometric objects as placeholders, and in other iterations of the Constellation, we will work to develop skeuomorphic objects that intuitively reflect the categories that they represent.
- The object's colour is determined for each component by the same K-means clustering algorithm used in our Colour Collage visualization and reflects the most dominant colour in the component.
- The objects are set to rotate on the spot in the Constellation sky, which both ensures that the object's distinguishing features can be seen by the user and introduces an element of movement to the visualization.
- The objects are distributed in three horizontal bands across the Constellation sky based on how they have been layered onto the page by Morgan. This layering information has been captured in the database through a z-index rating that we assigned to each clipping component. Those in the



**Figure 6:** User's Eye-Level View of the Constellation Visualization.



**Figure 7:** Screenshot of the Constellation Visualization Legend.

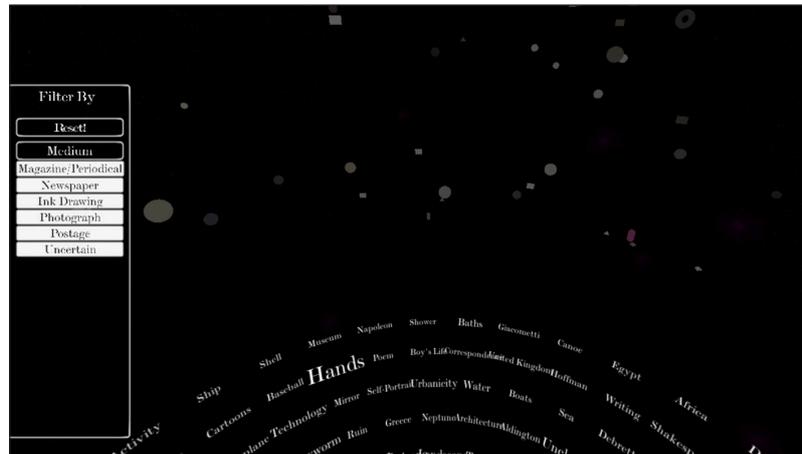
lowest band are rated 0, meaning they have been drawn directly on the scrapbook page. Those in the middle band are rated 1, meaning they have been pasted onto the page. Those in the highest band have been rated 2 or higher, meaning they have been pasted onto another clipping.

Apart from the z-index bands, the objects are arranged randomly, and are redistributed each time the page is refreshed. This visualization therefore plays with the way that a scrapbook can be opened onto any page and read in any order, while also providing the user with new perspectives on the data each time they engage with the prototype.

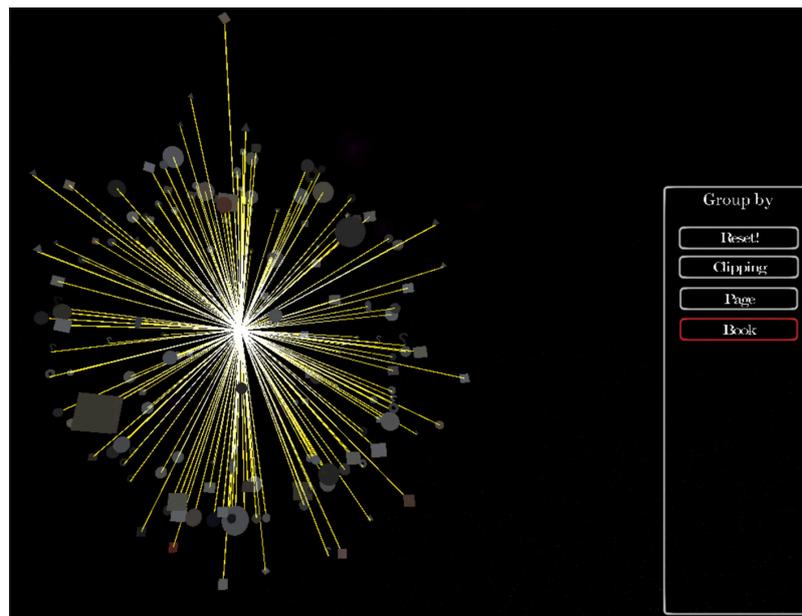
In order to explore the relationships between the universe of components brought together in the scrapbooks, there are three filtering and grouping tools built into the Constellation visualization:

- At the bottom of the user's screen are keywords arranged in a rotating circle that are associated with the components (see **Figure 8**). The size of the keyword indicates the frequency of the topic in our data. Clicking on keywords highlights them and filters out any components in the Constellation not tagged with these keywords.
- To the left of the screen, a pop-out menu enables users to filter by medium (see **Figure 9**). Selecting a medium from this menu filters out any components not associated with that medium.





**Figure 9:** Screenshot of the Constellation Visualization with the “Filter By” Menu Open.



**Figure 10:** Screenshot Showing Clipping Components from Scrapbook 12, Grouped by Book.

relatively unique one. On the left side of the zoomed-in panel, the component’s page number and scrapbook number are provided, and a descriptive abstract is given for both the clipping and the component. Clicking on the selected object at the centre



**Figure 11:** Screenshot from the Constellation Visualization, Showing a Selected Clipping Component and its Metadata.

of the screen deselects the object and zooms back out to the broader Constellation perspective.

As a generous interface, the Constellation visualization focuses on the interconnected nature of the scrapbooks and their content and encourages an appreciation of the large amount of data contained across even a few pages. Rather than the consistent guiding force of colour and size explored in the Colour Collage, the Constellation visualization offers multiple points of entry through medium, keywords, and data families at the level of clipping, page, and book, allowing the user more freedom to decide which of these facets interests them most. The user can also see how these forms of connection intersect, as filters and grouping functions can be combined and the statistics of the components speak to their presence as mediators amongst mediators. While we acknowledge that the randomized and changing nature of the visualization would not do well for a researcher looking for repeatable and traceable views on the data, and thus departs in some ways from the aim of generous interfaces to enable focused enquiry, our initial prototype sacrifices this repeatability in order to revel in the lively playfulness of the scrapbooks and the surprising ways in which information can present itself when exploring the scrapbook pages. In future iterations of the interface, we would like to develop a means of saving certain discoveries or views to better balance serendipitous discovery and repeatable views.

## User assessments

As prototypes, these visualization interfaces have proven invaluable to our thinking about the scrapbooks, illustrating how vastly different forms of interpretation are enabled when one feature or another of the scrapbooks becomes the focus and tapping into the rich potentials of metadata that are engendered by the scrapbooks and exist outside of copyright restrictions. However, these prototypes remain preliminary interfaces with much room to grow and evolve. To gather feedback on what developments might prove most useful to users, we engaged in an initial usability study for both interfaces with nine participants. With our participants' written permission and in adherence with ethics approval, we recorded our participants as they engaged in a think-aloud procedure, wherein they were shown the visualizations with little context and asked to spend time navigating the interfaces whilst speaking aloud to describe what they were looking at, what they were trying to find, and evaluating the visualizations as they interacted with them (Ericsson and Simon 1993). We also asked participants to fill out a System Usability Scale (SUS), which assesses and ranks a participant's perception of the usability of an interface (Usability.net 2006). For a prototype to be considered usable, an average SUS score of at least 70 is desirable.

All of our participants stated that the Colour Collage interface was interesting and usable. The buttons proved intuitive for users and the interface encouraged initial play, with some users even describing the Colour Collages as relaxing and pleasant to look at. In our SUS questionnaire, the Colour Collage received an average rating of 80 (Putra 2017, 66).

Meanwhile the Constellation visualization's SUS scores were more critical, with an average score of 65.45, and with significantly lower scores coming from the two participants in our sample with backgrounds other than Design Informatics (Putra 2017, 66). Given that the SUS score is close to 70, it indicates that the prototype is engaging and worth working on, but that it has not yet achieved an intuitive level of usability and, thus, of generosity.

The think-aloud results for the Constellation proved similarly optimistic but critical. All participants stated that the constellated space theme appealed to

them and four compared the grouping function output to a sun or to starbursts and reflected on how these bursts of data intrigued them. However, participants confirmed our hypothesis that the spurious geometric shapes of the component objects distracted from their ability to engage with the data. Participants also reported that the visualization was darker than they would like, and that it lacked colour. We have hypothesized that, rather than colouring the objects based on the most dominant colour in the component, which tend to be blacks, greys, and whites, more varied colour may be added by using less dominant, but perhaps more characteristic, colours from the component.

Taking this preliminary feedback into account, we believe that the Constellation prototype shows promise as a valuable first step in designing generous interfaces that enable serendipitous discovery for the scrapbooks; however, the complexity of the data and the complexity of the interface make it such that more work is needed before the Constellation visualization can realize its potential.

Across our user responses to both the Colour Collage and the Constellation prototypes, participants reiterated a desire to see the scrapbook pages behind the visualizations. We believe that this is partly because users are accustomed to the use of facsimiles in cultural collection interfaces and partly because the prototypes leave users with a sense of lack that needs to be better addressed. However, this reiterated request for the scrapbook images also indicates that our users became interested in the Morgan scrapbooks. Indeed, none of our participants had seen the Morgan scrapbooks before, and seven of our nine participants stated that our interfaces successfully increased their interest in wanting to visit the scrapbooks.

## **Conclusion**

While we continue to work with, and necessarily expand, the mediating network of inscription technologies connected to the Morgan scrapbooks, we consider this article as a moment of pause in our process, allowing us to take stock of the prototypes at this moment in time and to archive our own methodologies and explorations. Indeed, as we have suggested, prototypes are not unlike scrapbooks in that they themselves can be read as fringe artifacts: prismatic in their potential,

but also vulnerable and readily overlooked if not accounted for as the productive mediators that they always already are.

We argue that, rather than engendering a drive towards the perceived stability of an intermediary, as is so often the case with polished end-products, the prismatic presence of prototypes attests to the ways in which every mediator is an event that opens new possibilities for action and interaction, and so represents a beginning. We offer our prototypes as arguments in favor of further and expanded engagement with archival fringe artifacts like the Morgan scrapbooks in order to more fully unlock their prismatic potential. Our prototypes only begin to touch on how visualizations of metadata can be used to represent artifacts that might otherwise be marginalized and blocked by technological and legal restrictions, for example, as well as the ways in which databases and scrapbooks can productively speak to one another through their respective methods of storing and presenting information.

Building on these explorations and increasing the number of visible mediators that surround marginalized texts like the Morgan scrapbooks will grow the number of inscription technologies through which the meanings mediated by these texts are archived and told, and thus will directly shape the life and presence of their stories over time. Remediating these meanings is not, as Hayles reminds us, a neutral act, nor one that should be taken on lightly, but it is nonetheless necessary. Not only are these mediators and their stories vulnerable and in need of protection, the intertwined nature of the networks of inscription technologies that comprise our archives ensures that the absence of these mediators will impoverish all other inscription technologies and modes of meaning-making connected to them. As Garvey argues, in the case of scrapbooks, the scope of these connected inscription technologies includes most modern digital information management technologies, all of which stand to lose context and media-specific modes of engagement if scrapbooks are overlooked. With these intertwined stakes in mind, we hope our prototypes have begun to make visible the many worlds that can be reflected and refracted through even a few scrapbook pages, and the plethora of ways in which these worlds can be creatively engaged.

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The authors have no competing interests to declare.

## Author Contributions

- Authors are listed in descending order by significance of contribution;
- The corresponding author is bm;
- **Conceptualization:** bm;
- **Methodology:** ap, bm;
- **Software:** ap;
- **Validation:** ap;
- **Formal Analysis:** ap;
- **Investigation:** ap, bm;
- **Data Curation:** bm;
- **Writing – Original Draft Preparation:** bm;
- **Writing – Review & Editing:** bm;
- **Visualization:** ap.

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