Born digital preservation of e-lit: a live internet traversal of Sarah Smith's *King of Space*

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Abstract

Sarah Smith's *King of Space*, published in 1991, is the first work of science fiction produced as electronic literature. Released on a 3.5-in. floppy disk and requiring a Macintosh computer running System Software 7.0-MacOS 9x, it is now inaccessible to scholars interested in early digital literary forms, particularly of science fiction by women authors. Because this work is interactive and involves animations, images, sound, and words, preserving it requires an approach that retains as much of these experiences as possible for future audiences. To accomplish this task, our lab—the Electronic Literature Lab at Washington State University, Vancouver—used the Path-finders methodology developed by Grigar and Stuart Moulthrop, adding to it Live Stream play-throughs on YouTube promoted through social media channels. This essay outlines our process and discusses the potential of this methodology for preserving other kinds of multimedia and interactive work.

Keywords Electronic literature · Digital preservation · Digital humanities research lab

1 Introduction

Born digital literature, or electronic literature or e-lit, is a broad and varied field of artistic works combining text with the affordances of computers. In *Electronic Literature: New Horizons for the Literary* N. Katherine Hayles explains that electronic literature involves writing that is created and consumed using computing devices (Hayles 2008). Early examples include hypertext novels like Michael Joyce's *afternoon: a story* (1990),

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Stuart Moulthrop's *Victory Garden* (1991) oxford, and Shelley Jackson's *Patchwork Girl* (1995); animated poetry like Rob Kendall's *A Life Set for Two* (1994); database narratives like Judy Malloy's *Uncle Roger* (1986–8); and flash poetry like Ingrid Ankerson and Megan Sapnar's *Cruising* (2001), to name just a few examples.

E-lit is more than just digitized print text, and the early field anticipated that using computers to create and consume text would be fundamentally different than using paper and ink (Hayles 2002).

Since the debut of early experimental e-lit, our assumptions and expectations of how to interact with writing have adapted as the tools we use to write and read have changed. For example, concepts we take for granted now, such as blue underlined links in a text that take us to another heading or another document, were once considered controversial and disruptive.

King of Space, Sarah Smith's hypertext novel from 1991, is an excellent example of this sort of early e-lit. This work predates the introduction of the web browser and the current experience with text and media through the internet that we have accepted as standard.

Pre-web works like Smith's exist only in physical media, such as floppy disks and CD-ROMs, that are no longer readily available to scholars and critics. Even with access to the media, contemporary scholars would lack the necessary software tools, such as HyperCard and Storyspace, and the legacy hardware required for the works. Without access to the media and the computers, it is difficult to access the work in order to archive it; additionally, copyright issues, relating to proprietary software with which some of these works are produced deter efforts to migrate or emulate them. Thus, there is a need to facilitate the preservation of these works through documentation.

The Electronic Literature Lab (ELL) at Washington State University Vancouver,[1] established to facilitate advanced study of born-digital literature, is equipped to undertake documentation of these challenging early works of electronic literature. ELL maintains 61 legacy computers running a variety of operating systems, from the 1970s, 1980s, and 1990s that allow scholars to interact with early works of electronic literature using appropriate software and hardware environment, with which they were created and disseminated to readers. This strategy allows us to preserve works as it creates new discussions, descriptions, and criticism that are collected and archived.

In addition to the legacy computers, ELL also is the home to a collection of over 300 works of e-lit. These works currently reside in the removable storage media (floppy disks and CD-ROM disks), on which they were originally published. ELL also maintains a catalog of the hardware available in the lab and the hardware requirements of each work of e-lit in ELL's collection. This allows scholars using the lab to easily locate the appropriate machine to use to interact with the literature.

Maintaining a legacy hardware lab is a difficult undertaking. That is to say, because it would be prohibitively expensive and time-consuming to acquire the range of hardware necessary to make additional labs like ELL, we are seeking an alternate method of preservation that does not require scholars interested in these works to create their own labs or to travel to ELL. In addition, while there is currently some extremely interesting work being done in the field of cloud-based emulation, copyright restrictions hinder our ability to use emulation to make our collection of e-lit accessible by scholars not based in ELL. Thus, in order to best preserve access to the seminal works of e-lit

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[1] See Electronic Literature Lab web site, http://dtc-wsuv.org/wp/ell/.

housed in ELL, we needed a middle-ground between running e-lit off of perishable removable media in the ELL's legacy computing lab and making the works available through cloud-based emulation.

We decided to experiment with expanding the Pathfinders methodology described by Stuart Moultrop and Dene Grigar in their book *Traversals* (Moultrop and Grigar 2015) to include a Live Stream play-through of the work on YouTube that is promoted through social media channels like Facebook and Twitter.

In this article, we will first outline the need and issues with digital preservation of e-lit in particular. In the second section of the article, we will describe the case and the method that we implemented, building on the Pathfinders method where we included live-video streaming and social media elements to the Traversal. We conclude with a reflection on the advantages and shortcomings of this approach and provide practical implications for implementing a similar strategy for practitioners.

2 The drive to preserve

The idea of saving early born digital literature for posterity takes us to the question: 'Why?' Why is it important to undertake the preservation of this work?

Sarah Smith's hypertext novel *King of Space*, published in 1991 by Eastgate Systems, Inc., serves as an excellent example of the kind of work in danger of being lost and in need of preservation. It is the first work of science fiction produced as electronic literature and one of the first produced by a woman writer. Like hypertext e-lit, it is interactive, but it also involves animations, images, and sound. Built on the proprietary software program, Hypergate, developed specifically for it by the owner of the company, it was released on a 3.5-in. floppy disk and required a Macintosh computer running System Software 7.0-MacOS 9x. Because of the outmoded hardware and software, it is now inaccessible to scholars. This loss is keenly felt, especially due to *King of Space*'s role as the first e-lit work of science fiction.

E-lit reflects a time in which print writers like Smith were making the leap to the electronic environment in order to experiment with form. Not having access to this historical moment would be losing an important trajectory from the print culture of the late twentieth-century to the digital of the early twenty-first. Abby Smith Rumsey speaks to this issue in her book, *When We Are No More* (2016) where she suggests that we preserve artifacts because we value them as a cultural experience and as part of our collective memory. They impart information we need (2016: 161–2).

Previous generations, who faced the 'expense of maintaining vast and redundant stores of physical artifacts' and the costs of 'collect[ing] them and invest[ing] in their long-term access', struggled with the question: What can we afford to save? Today, however, with 'filters gone and information travel[ing] at the speed of electrons, virtually free of friction', where anyone and everyone is able to publish and distribute their work, we struggle with the question: "What can we afford to lose?" (2016: 7). In effect, Rumsey says, '[w]e face critical decisions as a society and as individuals about how to rebuild memory systems and practices to suit an economy of information abundance' (2016: 13).

If we take into account the born digital storytelling taking place on social media, like the most recent "Lazy Cat" narrative posted on Facebook by a group called TXT

Stories (2017), literary games, or even Twine stories created by students in our classrooms, there is an increased production of e-lit and thus no way of determining exactly how much e-lit is being produced daily. Rumsey's view is that '[o]ur obligation to future generations is to ensure that they can decide for themselves what is valuable' (2016: 176). In that light, we should consider retaining as much as we can despite Hans Obrist's reminder that 'everything has a limited life span' (2007: 25).

While books long served as the main method of documenting memory and culture, Abigail De Kosnik argues in her book *Rogue Archives* that the new 'cultural dominant' is digital media. More specifically, De Kosnik says that 'memory-based making—facilitated by digital tools published on digital networks, and saved mostly in "rogue" digital archives—is the cultural dominant of the early twenty-first century' (2016, 5–6). Today preservation does not rely on a system controlled by trained experts; instead, it requires individuals working largely independently but increasingly together to keep cultural memory alive. De Kosnik points to endeavors undertaken by non-trained practitioners and changing methods and formats as ways 'memory has gone rogue' (2016: 1).

Rumsey's and De Kosnik's call for changing preservation practices ties into the work that Richard Rinehart and Jon Ippolito are doing with their Variable Media approach to preservation. This is a method that attends to the need of each individual work rather than imposing a blanket methodology across all works (Dekker 2013: 88–89). Like Rinehart and Ippolito express concerns about cultural heritage, arguing that 'social memory'—that is, the 'long-term memory of civilizations—is predicated on the preservation of cultural artefacts' (2013: 92). Engagement with cultural memory harkens us back to De Kosnik who says, "[engagement is]... not only what comes after the making and distribution of cultural texts, it also not often precedes that making, or occurs at every step through the process of making" but "has come loose from its fixed place in the production cycle." It can "be found anywhere" and in any form" (2013: 4).

This rogue approach runs counter to methodologies put into place for print culture and certainly lies at the core of the preservation work taking place in the ELL. Preserving the body of early electronic literature, as we are doing, preserves not just the works—but as important—the cultural moment that carries implications of the period of history from which they came and the vision of the future they shared. The mid-1980s when the personal computer was introduced to mid-1990s when the browser was introduced constitute a decade when literary artists began to make the leap from print to the electronic medium, using (or creating for themselves) authoring systems like HyperCard, Storyspace, Narrabase, Intermedia, and others for creative expression. They experimented with databases, hypertext, animation and video, games and puzzles to tell stories, make poetry, and break out of essay writing traditions. It was also a time of great optimism of the future and the role digital technologies were to play in that future, as seen, for example, in Howard Rheingold's promise of great "democratic participation and sense of community, argued in his book *The Virtual Community* (2000). 'To be human, indeed to be living', Francisco Varela and authors tell us, 'is always to be in a situation, a context, a world' (1991: 59). This serves as proof that we even were once alive, and more specifically that we were making literature with computers as they became readily available (1991: 69).

The emergence of born digital works of literature coincided with the mainstreaming of the internet and infancy of the World Wide Web, and so standards and processes for creation and publication have changed rapidly. The uniqueness of the forms meant that many of the early works were not collected by libraries, or if they were, are not made accessible to the public for fear of damage to the disks, as seen in Judy Malloy's database novel *Uncle Roger* (1986–88), held at the Museum of Modern Art's library.[2] Additionally, many works published on the early World Wide Web have gone dark and exist only as files owned by the author, such as with Patricia Monaghan's poem, "Examination", (n.d.)[3] or by collectors, such as Diana Slattery's multimedia narrative *The Glide Project*, a copy of which was donated to the Electronic Literature Organization's archives by N. Katherine Hayles this year (2001). For many, the underlying software and hardware dependencies have rendered the work inaccessible or incomplete, such as the case of Sasha West and Ernesto Lavandera's Flash poem "Zoology" (2009). Even those that have been collected are more often stored in analog collections, like Stephanie Strickland's hypertext poem *True North* (1999), held at the David M. Rubenstein Rare Book & Manuscript Library at Duke University. The floppy disks are understandably preserved in a specialized location, but separated from the author's papers that contextualize them. Scholars, who manage to discover a work like Strickland's, likely lack access to the hardware necessary to experience it when they do travel to the Rubenstein to see it. In all cases, these innovative works of electronic literature involve varying degrees of interactivity and multimedia that cannot be easily presented with the cataloging and archiving practices of the time in which they were created. So many of them are disappearing before scholars have a chance to document them or archivists are able to preserve them for long-term access.

3 Preserving e-lit

One of the significant issues in preserving access to e-lit is that both the software and hardware infrastructures where the works were created to run on are now outmoded or obsolete. In the future, there is hope that emulation, or reproducing the original hardware and software environment on contemporary computing platforms can capture some or even most of the interactive experience of navigating an e-lit work. Currently, however, navigating the works using well-maintained legacy computing equipment provides the best access to and experience with these literary works. That said, it is difficult to share this experience with scholars and readers who are not able to travel to the physical location of labs capable of viewing these works. Grigar and Moulthrop (2015) developed the Pathfinders methodology as a means to maintain the cultural experience afforded by the original environment and reach a broader audience than possible by the limited access to legacy hardware.

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[2] MOMA Library Catalog reference for Judy Malloy's *Uncle Roger* may be found at: http://arcade.nyarc.org/record=b550258~S8

[3] "Examination" is the short animated poem for the web that Patricia Monagham created along with the many books she wrote and published. It is the only work of e-lit by her known to exist. After going off- and online periodically while the author herself maintained the interactive version, the work has remained offline after the author passed away in 2012.

Using the Pathfinders methodology to document these deteriorating works is a stop-gap measure. It is a rogue-archives technique to save what we can with the resources we have to hand. In a perfect world, scholars would have ready access to legacy computing labs. In a perfect world, scholars would also have access to digital copies of these works and emulation environments that allow them to be experienced on contemporary computing hardware. In the absence of access to legacy hardware and emulation, documenting the experience of navigating a work of electronic literature can succeed in keeping these works alive and accessible to contemporary scholars.

The Pathfinders methodology includes the production of a Traversal – filming a reader or readers interacting with an e-lit work and reading aloud through a single path through the nodes and connections of the text (Moulthrop and Grigar 2015). While capturing a single Traversal flattens the multiple paths of the narrative, or just shows one out of many possible paths through the text, obscuring all of the possible alternate choices, it does allow a single perspective into the work to be captured and shared electronically to the widest possible audience. Multiple Traversals, by both author and readers, provide better insights into the possibilities offered by the hypertextual structure.

In addition to capturing a single Traversal of a hypertext story or a work of e-lit, the Pathfinders methodology also includes interviews with the author to provide additional context and relevant background information to the work as well as include critical response to the works, photos of the physical artifact, and sound files (Grigar and Moulthrop 2017, Moulthrop and Grigar 2015). Together, these components provide insight, background, and conversation about these works that otherwise may be forgotten.

One shortcoming to the Traversal process is that it captures one reading among many possible readings of a work. Smith's hypertext novel contains 317 nodes and offers 25 different endings. The interface offers nine different choices to enter the narrative: 'All', 'text', 'is', 'a', 'game', 'history', 'Begin King of Space', 'Playing the Game', 'Story Background', and 'Hypertext Theory'. 'All', for example, provides a short narrative with three options to choose from, while "text" takes the reader to a puzzle. The other options offer their own entry points into the story. The Traversal can only capture one combination of choices and cannot reveal the rich complexity of hypertext. In the Pathfinders project, Grigar and Stuart offered three different readings for each of the four hypertext novels that they studied. But the problem still remains that there are exponentially more readings than what can be offered using this methodology. Despite this limitation, the Traversal does make it possible for digital scholars to experience these works in a meaningful way.

4 Methodology: live internet traversals

For our project, we asked ourselves: How can we expand on the existing success of the Pathfinders model to engage an even wider audience? In terms of providing access to a library of previously inaccessible texts, the existing methodology is successful. However, the availability of streaming media via YouTube and social media like Facebook and Twitter offer advantages that suggest ways to broaden that access and reach a larger audience. Thus, we decided to take advantage of these technologies to broadcast our Traversals live and implement a social and participatory aspect to our scholarship.

Capturing a Traversal live introduces a few new challenges. The role of the reader, the one who is navigating the work, has more of a performative aspect. Since the live broadcast removes the option of splicing together multiple takes in post-production, the reader's role requires more preparation and rehearsal. The video and audio mixing process requires more camera angles and microphone positions, as the live performance does not allow for the set to be taken down and re-arranged between reading, author interview, and audience Q & A portions of the Traversal.

Broadcasting our reading live also enables us to capture more participation in the process of generating the Traversal. Undergraduate researchers working with us in the lab cultivated audiences on Twitter using the #elitpathfinders hashtag (E-Lit Pathfinders Hashtag) and on Facebook using the e-lit Pathfinders page (Pathfinders — Home). Additionally, the video is broadcast live using YouTube via the Pathfinders e-lit YouTube channel ("Pathfinders e-lit"). Each of these three avenues for connecting with live audiences is monitored and moderated by an undergraduate researcher or a member of the ELL staff. These channels allow us to add live conversation to the Traversal that includes scholars, critics, and artists from around the world. After the event, the content of these three social media feeds, plus the photographs taken during the live event, are gathered and saved using the Storify service.

Performing our Traversals of e-lit live, online, and using social media channels adds a participatory aspect to the existing Pathfinders Traversal model. We are able to keep these seminal works alive by sharing their existence with a wider audience, capturing more of the depth and richness of the scholarly conversation surrounding these works, and recording the ensuing conversation for posterity.

In order to make the multi-layered activity of a live internet broadcast of a Traversal function, our undergraduate researchers come prepared to fill a variety of specific roles. The performance roles in front of the cameras and the technical roles behind the cameras are filled by faculty, staff, and outside experts. Thus, undergraduate researchers fill three other key roles. First, they research background material on the work being traversed. This enriches the social media streams with key context, background, and critical perspectives. The student researchers also curate the social media streams. On Facebook, Twitter, and the YouTube channel students (and occasionally faculty) monitor the conversation and post information from their research, adding to the recorded conversation. Finally, having prepared by researching in advance and through curating the live conversation streams, undergraduate researchers are primed to enrich the question and answer portion of the live Traversal.

4.1 Case

We explored this method for expanding the reach of e-lit to Sarah Smith's hypertext novel, *King of Space*. This novel, begun in 1988 and published in 1991 by Eastgate Systems, Inc., is a key example of early pre-web hypertext. It runs on Apple System Software 7x, 8x and 9x used on Macintosh Classics, Macintosh SEs, Macintosh LCs, and Macintosh Performas. Software requirements include Hypergate—an early hypertext system created by Mark Bernstein that was written in FORTH for the Macintosh operating system (Bernstein)—and requires Quicktime Movieplayer 2.x.It is a media-rich work consisting of 317 lexias and 25 different endings and involves numerous works of ASCII art produced by artist Matthew Mattingly,

music composed by Michael Derzhinsky, and animations created by Mattingly, Bernstein, and others. Within the novel, one can also find several puzzles that must be solved and games readers can play.

As a work of literature, *King of Space* is noteworthy. It is the first work of born digital science fiction, predating John McDaid's *Uncle Buddy's Phantom Funhouse* by a year, and the first hypertext published as a literary work that blurs the line between literature and games.[4] The story involves a plague that can only be stopped through a sexual connection with the priestess. Seen through the lens of cultural theory, *King of Space* carries a strong feminist focus, exploring gender roles and dystopian worlds. The games and puzzles embedded in the work function as *agons* the reader must overcome in order to find success, which may be defined as engaging in the story long enough to save the world. In some cases where readers attempt to assume agency, Smith has purposely not allowed the opportunity. To make it successfully through the gauntlet of tests, then, constitutes a kind of heroism. It is also important to note that the work, created by a woman writer with an established reputation in the print world, also speaks to the fact that the field of electronic literature has long been well represented by women and was, early on, pioneered by women curious about the electronic medium, but without formal university training as computer programmers. Smith joins Judy Malloy, M. D. Coverley, Stephanie Strickland, Carolyn Guyer, Jane Yellowlees Douglas, Mary-Kim Arnold, Martha Petry, and others who were visual artists, poets, and novelists making the leap from print to digital at a time when the mainstream public were not yet online. Smith's own interest in creating a hypertext novel was heavily influenced by quilting, collage, and "choose your own adventure" games. We see these influences in the confluence of story, puzzle, and games in the work. Smith also views writing as a dialogue between readers' expectations and the author's vision and is particularly interested in how characters function in this kind of story, challenging the notion that characters needing to be consistent. Indeed, Smith's characters bleed into one another often (Smith 2017).

4.2 Implementation

The Electronic Literature Lab (ELL) at Washington State University, Vancouver, has been established to facilitate advanced study of born-digital literature. Our current project involves the documentation of pre-web works of electronic literature. This documentation provides scholars with access to pioneering work that otherwise would be difficult or impossible to achieve. Our process also serves to preserve the work, as it creates new discussions, descriptions, and criticism that are collected and archived. ELL provides an ideal space to undertake the project because it contains 61 vintage Macintosh & PC computers, dating back from 1977, vintage software, peripherals, and a library of over 300 works of electronic literature and other media. One of a handful of media archaeology labs in the U.S., it is used for the advanced inquiry into curating, preserving, and the production of born digital literary works and other media.

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[4] The website for the Traversal performance is available here: http://dtcwsuv.org/wp/ell/2017/09/24/traversal-ofsarah-smiths-king-of-space/. The captured video recording of that broadcast is available here: https://youtu.be/kXJIcWctuDM, and the social media streams are preserved here: https://storify.com/nnschiller/king-of-spacea-live-elit-pathfinder-traversal.

The live internet Traversal of Sarah Smith's *King of Space* was broadcast on 29 September 2017.[4] The process of preparing for this Traversal began in mid-August, with Grigar arranging for the narrator to participate, and Dr. Amber Strother of WSU Pullman to do the performance. At this time the undergraduate researchers were given access to *King of Space* and the computer on which to read it so that they could familiarize themselves with the work before the Traversal. Grigar also began collecting the bibliography of criticism surrounding *King of Space*. Preparations also included assigning roles to the undergraduate researchers. As listed above, their roles included curating the Facebook live interactions on the Pathfinders page, curating the Twitter live interactions on the #elitpathfinders hashtag, and taking still photographs during the live Traversal.

At this time, our technical support professional Greg Philbrook began preparing our lab for the live internet Traversal. The preparation steps included he and Grigar choosing the computer that was best suited to handle the work and the video recording. While several machines in the ELL are capable of running the *King of Space* software, finding the one that offered the optimal monitor size, color display, and a minimum of light glare took a considerable amount of testing. Eventually, we settled on the Mac Performa Power PC 5215 CD, running MacOS 7.6.0. This machine showed off the visual and audio properties of the literature and also was best suited to being captured on video. One limitation of the Apple hardware of that era is a lack of an external video-out signal, requiring us to use a camera to capture the monitor. This introduces issues of framing the shot, reducing glare, and horizontal scrolling lines from the cathode ray tube technology of the monitor. Philbrook also set up additional camera feeds and microphone placements at this time. This arrangement allowed us to capture the narrator and also the audience during the live question and answer period following the reading. We used OBS studio by the Open Broadcaster Service to gather these feeds and pass them to YouTube for the broadcast (*Open Broadcaster Software*).

The week of the Traversal, Strouther came to ELL Team went through a rehearsal for the live Traversal. Technical details of camera angles and microphone placement were worked out, and intellectual details surrounding which hyperlink choices best show off the work in our limited window of time were also planned. An interview with the work's author, Sarah Smith, took place and was recorded in advance of the Traversal.

The day of the Traversal the undergraduate researchers, ELL faculty and staff, and Strother gathered in the lab. Those curating social media feeds had notes from their research and notes from Grigar's critical study on hand to feed content into the social media channels. While Strother performed the Traversal, Grigar moderated the YouTube chat and later the question and answer session; the undergraduate researchers documented the event on social media and with photography, mixing in prepared research on the work and its criticism with observations, comments, and interactions with other participants.

After the Traversal, the ELL faculty and staff reconvened to reflect on the event. We discovered that the use of live stream technology and social media did, in fact, extend the reach of the Traversal. The interactions gathered on Twitter differed from those gathered on Facebook. The chat conversation from the YouTube channel had the most interaction and the fastest paced conversation. Gathering Twitter and YouTube together, plus photographs on Storify was a useful way of providing a lasting documentation of

the conversation. Having multiple channels open and monitored during the question and answer session allowed for a broader, more varied, and richer conversation. The final step in our project is to gather this data from all seven Traversals planned during the year into an open-source multimedia book, entitled *Rebooting Electronic Literature*, built on the Scalar platform and disseminating it widely via the internet.

4.3 Discussion

In retrospect, we discovered that the live internet broadcast of the Traversal did, in fact, provide contemporary scholars access to heretofore unavailable works of electronic literature. Sarah Smith's *King of Space*, as mentioned, has been out of circulation for over 10 years because it was neither migrated from floppy disk technology, nor updated to contemporary operating systems. However, since the live Traversal, we have had an average daily page view of 56.4. Daily unique visits to the site averaged 3.4. We also averaged a first-time visitor to the site every two days. We experienced on average 2.9 return visits per day. Thus, far we have had 3776 visitors to the site to view the Traversal and to experience *King of Space*.

Additionally, the live Traversal added value to the existing Pathfinders methodology. Having multiple paths for participants to interact with the event provided us with a rich transcript of conversation about *King of Space*. We were able to document and record this conversation and add it to the record available to scholars. Since we lack the rights to make *King of Space* available on the open internet, providing the conversations surrounding the work, its context, and its impact available on video and text documents the work and makes it less likely to be forgotten. The Pathfinders methodology has been proven to be an impactful and practical step we can take to document early works of e-lit. Live internet broadcasts of these Pathfinders Traversals extend the reach of this documentation process, making it more rich and including more voices in the story.

5 Final thoughts: best practices

The looming loss of early works of e-lit leads to our final comments about the best practices for preserving them.

First, the time to preserve is now. We cannot hesitate to begin this important work because the rate of obsolescence has increased. Second, to preserve effectively, we must use multiple methods: Emulate when we can; migrate when possible; and make the work available to the public, even if it means collecting vintage hardware and software for reading the works until which time other methods for preserving arise. We should follow Rinehart and Ippolito's notion and attend to the specificities of the works themselves when deciding how to preserve them (2013). Third, when archiving the original work, we should maintain the integrity of the work by keeping its components—floppy disks, author's papers, critical essays, and other contextualizing resources—together. Fourth, offer the public opportunities to access the work both on site and at a distance, as we are doing with the Electronic Literature Lab's open library, live Traversals, and open-source multimedia books. Fifth, document the works in Wikipedia and in databases like the Electronic Literature Organization's *Electronic Literature Directory* and ELMCIP's *Knowledge Base*. And finally, it is necessary to use

open-source options for production and preservation to ensure accessibility over time. Following these suggestions, works such as Sarah Smith's *King of Space* can remain available to the public and achieve the recognition they deserve.

References

De Kosnik, A. (2016). *Rogue archives: Digital cultural memory and fandom*. Cambridge: MIT Press.

Dekker, Annet. (2013). On re-collection: New media, art, and social media: An e-mail interview with Richard Rinehart. In Annet Dekker (Ed.) Speculative scenarios. (pp. 88–93). Eindhoven: Baltan Laboratories.

Grigar, D., & Moulthrop, S. (2017). *Traversals the use of preservation for early electronic writing*. Cambridge: MIT Press.

Hayles, K. (2008). *Electronic literature: new horizons for the literary*. Notre Dame, Ind: University of Notre Dame.

Monaghan, P. (n.d.) Examination. A print version of the interactive poem was published (2002) *Dancing with Chaos*. Cliffs of Moher: Salmon Publishing, 20.

Moultrop, S., & Grigar, D. (2015). Pathfinders: Documenting the experience of early digital literature. Nouspace Publications. Retrieved December 4 2017 from http://scalar.usc.edu/works/pathfinders/index.

Obrist, H. U. (2007). The future is a dog. In *Everything you ever wanted to know about curating*. Berlin: Sternberg Press.

Rheingold, H. (2000). *The virtual community: Homesteading on the electronic frontier*. Cambridge: MIT Press.

Rumsey, A. S. (2016). *When we are no more: How digital memory is shaping our future*. New York: Bloomsbury.

Slattery, D. (2001) The Glide Project. Online documentation of the project available at https://elmcip.net/creative-work/glide-project and http://psychedelicsandlanguage.com/the-guild/diana-slattery-glide/, retrieved December 8, 2017.

Smith, S. (2017). Interview. Retrieved December 4, 2017 from http://scalar.usc.edu/works/rebooting-electronic-literature/interview-for-sarah-smiths-king-of-space?path=sarah-smiths-king-of-space.

Strickland, S. (1999). *True North*. Watertown: Eastgate Systems.

TXT Stories. (2017). Lazy Cat. Facebook. Retrieved December 12, 2017 from https://www.facebook.com/txtstories/videos/234390640463135/

Varela, F., Evan, T., & Eleanor, R. (1991). *The embodied mind: Cognitive science and human experience*. Cambridge: MIT Press.

West, S., & Ernesto L. (2009). Zoology. *Born Magazine*. Retrieved December 13, 2017 from http://bornmagazine.org/projects/zoology/