

# *PhronesisMU*: Reclaiming Aesthetic and Rhetorical Potentials within the Software Obsolete

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Since their heyday in the mid-1990s, MUDs and MOOs have become software relics of the early Internet. Despite their age, these platforms continue to hold untapped avenues of potential for the writer, both established and developing. This essay reviews these spaces and how they continue to challenge the current technological and social media paradigms. We then examine the collaborative, creative, and communicative potential within these environments with a view toward their use within a modern context. Finally, this paper serves as an introduction to a new MU\*space, *PhronesisMU*, which was developed for a workshop held at the 2018 Computers and Writing Conference, as well as an invitation to create and explore this world dedicated to the CandW community.

Originating with Richard Bartle and Roy Trubshaw's *MUD1* (1978), "multi-user dungeons" (MUDs) were among the earliest of publicly accessible, electronic, networked worlds. Influenced by the text adventure games that were being played at the time, Bartle and Trubshaw's project maintained many of the fantasy trappings found in *Colossal Cave Adventure* (Crowther and Woods, 1976) and *ZORK* (Lebling, Blank, Anderson, and Daniels, 1977). Using text inputs, players of *MUD1* and its progeny could explore text-based environments and interact with other players. MUDs continued to proliferate with many focusing on combat and themes culled from fantasy and science fiction. Among these variants, the "MUD object-oriented" (MOO) focused more on the social connections and creative potentials fostered by these enigmatic places. Unlike most MUDs, where players were unable to manipulate the world and the objects within it, most MOOs offered players the capability to create objects and spaces within the world. One of the more successful of these, *LambdaMOO* (Curtis, 1990) is still in operation today, serving as a testament to a seemingly bygone era of multiplayer games.

As relative newcomers to the Computers and Writing conference, we had been unaware—though not altogether surprised—that many in the CandW community had been wallowing in MUDs and MOOs during their heyday

some twenty years ago. Amy Bruckner and Mitchel Resnick's *MediaMOO* (1993), as the quickest example, became popular through regularly scheduled gatherings. The "Tuesday Cafe" was frequented by affiliates of the conference and, later on, the "TechRhet Barn" on the Connections MOO would become favored by the same crowd. Jan Holmervik and Cynthia Haynes, who literally wrote the textbook on the pedagogical value of MUDs and MOOs with *High Wired* (2001), are frequenters of the conference. To put it mildly, the CandW contingent is not only familiar with MOO-space, they are among its principal residents and architects.<sup>1</sup>

Just prior to discovering this vein of CandW history, we had created and demonstrated the MUSAIC MUSH ("multi-use shared hallucination") at the Midwest Interdisciplinary Graduate Conference (MIGC), held annually at the University of Wisconsin–Milwaukee. This simple MOO-like space, built from an open-source package provided by *PennMUSH* (1992), garnered a good deal of interest from conference attendees, one of which used MUSAIC in their classroom shortly after the conference. Despite our divergent fields of study within the field of English studies, we each found MU\*space<sup>2</sup> to be compelling not just as a distraction from scholarly priorities but as a subject of inquiry in itself. For Kristopher, whose dissertation is a phenomenological look at how players acquire a sense of place within computer games, the MOO served as an archetype and culmination of many of the qualities we seek in online communities. For Geoffrey, examining MU\*Space from a technical and science writing perspective opened up avenues for inquiry into the collaborative construction of digital structures via code and how that construction was linked to the cultures and ideals that different MU\*spaces embrace.

This paper serves several purposes. First, it evaluates the MOO at the locus of where our perspectives—one metaphysical, the other pragmatic—converge. Though approaching from slightly different origins, the second facet of this essay is a conjoined argument for a revisitation to MU\*space. This revisit is not out of nostalgia. We advocate for a look back at MUDs, MOOs, MUSHes, etc. simply because their potentials illuminate how many facets of our digital lifestyles fail to compare to the collaborative, creative, and communicative provisions of these somewhat archaic environments. Finally, this essay serves as a preamble to what we hope will be a boon to the Computers and Writing Conference for some time to come, a MU\*space called *PhronesisMU* (2018) which was to be developed as part of a workshop held at the 2018 conference. This workshop was designed to help attendees organize and create a

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1 KP: Many thanks to Michael Day for providing this brief history during the 2017 Ride2CW gathering.

2 Derived from the term "MU\*" that is used to indicate variations of MOO, MU\*space will be used in this essay as our umbrella term for all works in the MUD and MOO lineage

new MU\* dedicated to the CandW community. Unfortunately, the workshop was cancelled due to lack of participation. *PhronesisMU* has nevertheless continued to develop and expand thanks to the participation of a few from the conference and others who have discovered the space through other means.

## Brief History of MU\*space

A brief history of MU\*space is warranted given that it has now been forty years since MUDs first pioneered their parcel of the digital landscape: While students at the University of Essex, Roy Trubshaw and Richard Bartle created the first so-called “multi-user dungeon” (MUD) in 1978. *MUD1* would be among the first digital networked spaces capable of hosting several visitors at once. According to Bartle (2004), “dungeon” was used not out of desire for a fantasy theme but rather as a referent to *DUNGEN*, a clone of *ZORK* that Trubshaw had been playing at the time. Unlike the graphically-rendered spaces of other games like *Maze War* (Colley and Thompson, 1973), *MUD1* took a page from text adventures and represented space verbally. Much like *Colossal Cave Adventure* and *ZORK*, these networked spaces compelled players with descriptive landscapes and catacombs but added the benefit of being able to explore while interacting with other players.

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First player since reset, initialising...
Initialised.

Multi-User Dungeon - MUD1 Version 3E(19)

                Happy 40th birthday, Multi-User Dungeon!

"0n 20th October, 1978 (possibly two or three days earlier, we're not
 exactly sure) Roy Trubshaw sat down at a computer terminal at Essex
 University and coded the first version of a program he called MUD."

                -- Richard Bartle

Origin of version: Thu Nov  1 22:04:40 2018
Welcome! By what name shall I call you?
*
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Figure 1: *MUD1*

Bartle and Trubshaw’s innovative space would spawn numerous others, many taking on different themes while adding new capabilities. Due to infancy of the network and limited access, MUD-space was a niche attraction. This factor coupled with the growing bevy of more visually compelling games further slowed the technological evolution of MUD-space. Those that were involved in MUDs, however, formed communities devoted around the shared

sense of place. For many MUD groups, socialization and fellowship became more attractive than dungeon crawling and combat. *TinyMUD* (Aspnes, 1989), among the most (in)famous of these, was released in 1989 by James Aspnes while at Carnegie-Mellon (Haynes and Holmevik, 1998). *TinyMUD* focused more on social interactions and, in later iterations, players could build and furnish their own spaces within *TinyMUD*. Pushing this capability further, Steven White and Pavel Curtis would develop *TinyMUD* into *MOO* (“MUD Object Oriented”) during the early 1990’s. MOOs not only enabled players to communicate, but these exchanges could also be flavored with “poses” or flavor texts that articulated postures, moods, and gestures. In addition to this more complex method of communicating, players were also privy to creating objects and spaces on MOO servers. Curtis would eventually take over the project and rename it *LambdaMOO* in the 1990s.

MUDs and MOOs provided environments that provided new social and creative outlets that were accessible in an increasingly accessible network space. MOOs continued to proliferate and branch off to form different varieties, but most preserved the ability to connect with others and shape the virtual environment. As such, cliques were formed and, when allowed by administrators, localized governments and sophisticated social dynamics were developed. These dynamics were underscored in Julian Dibbell’s (1998) report, “A Rape in Cyberspace” which detailed the reaction of the *LambdaMOO* community to a player’s (or multiple players) sexually-provocative abuses of others. Despite social infractions particular to any community, these online places continued to thrive (*LambdaMOO* is still running, in fact) and splinter off into different flavors, including the M\*U\*S\*H. Like its MOO predecessor, M\*U\*S\*H (“multi-user shared hallucination”) environments are electronic text-based worlds that are collaboratively constructed by its inhabitants.

## MUDs in the Modern Context

The movement from MU\*space to massively multiplayer online role-playing games (MMORPGs) is an example of the way in which the iterative process of modern software development works. Older software is revised and improved upon through succeeding development cycle. In “From MUDs to MMORPGs: The History of Virtual Worlds,” Richard Bartle (2009) points out that it was inevitable that graphically rich virtual worlds would supplant those found in MU\*space. For software and game companies there is an assumption that these newer software platforms automatically transcend the previous structures on which they have been built. This push to redesign, rebuild, and recreate has become the focus of the development process. As a result, we live in an era of near constant technological change. Often framed as “dis-

ruptive innovation” the hardware and software that we use to create, build, and communicate regularly shifts morphing in form, structure, and capability (Christensen, 2013).

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Corridor
This east-west corridor is a bit shabby, with peeling
wallpaper and flaking paint. To the south is a wooden,
rather unassuming door. A wooden placard swings from
above, bearing the name 'Ye Olde Chain 'n Cow'. There is
an imposing wooden door to the north, bearing an engraved
brass plaque. You get the impression that you can leave a
message for the Architecture Review Board by writing on
the paper and slipping the note under the door. Tacked to
the wall, next to the door, is a pad of paper. A
wastebasket sits on the floor outside the northern door.
An old request lies forgotten on the floor gathering dust.
You see instructions, carnival scale, and Carrot's Guide to
Quota here.
look me
Rhizome
A miniature cloud (cumulonimbus?) whose undulating teal
surface ebbs and throbs over the calming pulse of an inner
storm.
*E is awake and looks alert.
Carrying:
paper scrap

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Figure 2: LambdaMOO screen capture

The MU\*space and the virtual worlds that follow it actively embrace this model where new features and expansions are regularly added to the already existing world structure. In many ways, the players are engaged in a widespread and unending beta test. Such experiences are becoming common outside of the context of these virtual worlds, however. As these development practices proliferated into other forms of online and social media, more and more people have been pushed to adopt new technologies as they become available without a full understanding of the consequences of that adoption. Often, these updates are mandatory and linked to the growing proliferation of the software as a service (SAAS) model which many MUDs and MMORPGs adopted as a way to finance further development. Focused on this loop of innovative destruction, developers race to create new applications and platforms. As they do, the ways in which we create and communicate using those platforms are irreparably impacted. Creators and scholars can only begin to address the creative and rhetorical limits of a platform or medium before it is replaced by another. This poses a twofold problem. One, we are far from understanding the full consequence of the software and hardware architectures that we employ and are unable to adequately develop that understanding be-

fore the platform becomes obsolete. Two, the creative and communicative opportunities offered by these older platforms are not always replicated in newer forms of software and hardware. In the aggressive push for reinvention, very promising and useful technologies are lost and with them a vast array of opportunities for communication and sharing.

MUDs and their progeny are excellent examples of such lost opportunities. Developed as collaborative and open codebases, MUDs provide a unique look at the development and creation of software spaces at every level from the hardware and networks that supported the MUD and its users, to the system and code that defined the MUD engines, to the internal design and shape of the textual spaces that made up the virtual worlds in which builders and players co-created. While modern software seeks to hide the code of the system and shrouds the bones of the development process isolating it from the larger community of software users, MUDs foreground that process. They invite users to participate not just in structuring the world, assembling and arranging blocks of texts, but in creating the foundations of that world by defining the very objects and behaviors that are possible within it. For all the power that modern games employ, almost none have the same capacity to provide as open a space for creative engagement.

It is this level of openness and collaboration that draws us back to these spaces. Indeed, as participatory structures MUDs offer a series of lessons that highlight what is, in our current paradigm, a significantly different approach to technological creation.

## **Write the Manual—Write the World**

One key difference is that MUD development offers participants in the virtual world an opportunity to contribute to that world's construction from the code level up. MU\*spaces actively work to blur the user/developer binary. At the core of this is the development of the MOO world as a shared practice of the players which is very different from the packaged software and pre-designed virtual worlds of today in which agency is doled out and controlled in very specific ways. The starting worlds of most MOOs are small and empty. This is by design. A MOO is a co-created universe built by the users who inhabit that space. While some MUDs will structure a set of rules and hierarchies, many later versions of MOOs allow every level of creation to be discussed and defined. At this very basic level, early MU\* creation can be seen as a form of meta-software development. Objects, systems, and behaviors must be architected, methods, and procedures that define their relationships must be defined, and structures of interaction and communication outlined and established. MUD development at this level differs quite a lot from modern development

processes, however. In many current development practices, developers write and design code individually and then merge the resultant work into a larger codebase. The applications that lie at the core of MU\* architecture are themselves developed in this way. These applications abstract the layers of object and structural design to provide a space where such elements can be developed from inside the MU\* world, where different users can connect to, contribute to, and view that work. MU\*s allow for the synchronous co-creation of these structures. A builder can write and prototype immediately and in the presence of other builders who can suggest changes, take control, and modify the form and structure of what is being created on the fly. Because these builders are crafting not only the appearance of the MU\* world but its core hierarchies and behaviors, this promotes a much more democratic approach to the creation of the MUDs world.

For rhetorical scholars, this co-mediated production positions the MU\*space as a sort of Agora in which citizens argues over the development of the larger polis. MU\*spaces in this way also provide relevant examples of the political challenges that come as part of that process. Rules must be developed at both a technical and social level. The definition of the participants themselves is a part of this process. Creators on the MU\* must decide who is a citizen, who can build, and who is not. For some, a rigid hierarchy may be designed in which only those who are approved can contribute the construction of the space. These questions and challenges force the designers and the players to confront very difficult and complex notions of access and control with regard to audiences. MU\* creators must consider audience response and the goals of the systems they are introducing.

To create these systems, they must write them into the world. For the creators of a MUD the act of writing is the act of world creation not removed by metaphor in practical terms. When a participant writes an object, that object becomes a part of that world. It takes on properties and characteristics within that world. This creation immediately highlights the limits of authorial agency with these spaces of construction. It is very possible, even likely, that an object in the world can be fundamentally altered by others within that world.

In the first installation style MU\*space we designed for a conference, a user created an entire art museum complete with paintings and descriptions. It did not take long for other users to abscond with those paintings, freeing them from the limits of the museum, and placing them, haphazardly, throughout the world. All that remained of the paintings was a small bit of graffiti. Meanwhile, explorers in the farther reaches of the MU\* universe would often find themselves looking at a strange painting incongruously placed in the most obscure and unlikely of places. This playful mischief belies the deeper theoretical elements at play within this interaction. It raises question about au-

thorial autonomy in the co-created space while simultaneously challenges the idea of what presentation spaces are and what they should be. The individuals who absconded with the paintings and spread them throughout the world forced participants to rethink their own interpretations of art and what art becomes when freed from the structural expectations that surround it.

## MUD Strategies: Bricolage and Creative Tactics

The ability to draw from, adapt, and shape existing cultural forms is a crucial part of MU\* development. Often MU\* designers will create a MU\*Space as homage to different fictional worlds. Early MUDs, of course, drew from fantasy games and mixed elements of myth with hack-and-slash combat. This appropriation of cultural material remains a critical part of MU\* development, even today. A quick review of those MUDs that are still active shows that most are designed or built around other forms of cultural media. There are several MUDs and MOOs that remain focused on the fantasy genres that marked their creation. Others have taken a page from the 80s cyberpunk genre which is itself a reformation of classic Noir (Shaviro, 2003). MU\*spaces in this context do not simply act as packagers of media. Instead, they give the participants the opportunity to engage with and change that media. As with the museum, this ability to interact with these cultural structures, allow the participants to perform critiques and develop counter-narratives that push back against the dominant cultural assumptions. These MU\*Spaces then can become spaces of tactical interaction for participants (Certeau, 1984).

It is certainly true that modern technology has provided numerous places for tactical engagement, but what sets MU\*s apart in this context is the incredibly low level of risk that these spaces provide for these tactical responses. MU\*s are not connected to broader structures of control and observation. There are no Facebook links, no Google tracking; the permanent of nature of the Internet is a bit less permanent inside these systems. Most MUDs and MOOs are also inherently insecure. While some advances have been made in securing modern MU\* codebases, participants tend to use aliases and are encouraged to use a random password for access. This openness carries with it a distinct sense of impermanence. Even if a MUD remains intact for decades, there is no record of the builder save the name the builder uses and, occasionally, their network address. MUDs exist in a sort of niche space outside the modern structures of the Internet. In these liminal spaces, they provide opportunities for creative engagement that is just not practically possible in modern online spaces.

As software, MUDs and MOOs exist as archaic remnants of a hopeful past in which Internet technologies were imagined as tools for opening up access



and provided creative tools and opportunities for all. While many of those Utopian ideals have fallen flat, these technologies still carry with them the elements of shared creation. For scholars of digital texts and rhetoric, there is still much to be gained from a deep dive back into these now nearly lost technologies. Of the many different codebases that were, at one time, under active development now just a handful remain. Hobbyists keep a few servers alive, and the software sits waiting for a chance to reconnect people in ways that haven't been replicated in modern development. These applications still offer an incredible amount of rhetorical and creative possibility. Furthermore, the cost for using the software is incredibly low. MUD codebases are open and fairly stable, if older. System requirements for today's MUDs are minimal and installation and management has been streamlined in many ways. At the same time, working on the installation and subsequent development of the MUD connects users to architectures that hidden in modern applications, but just as present. The *PhronesisMU* is just one opportunity to engage with and create using this software.

## Conclusion: MU\*spaces or MU\*places?

So why a return to MU\*space?

As mentioned, these archaic digital worlds remind us of the potentials for creating dynamic, social spaces online. MU\*space has inspired numerous several game genres, a few of which have been mentioned. We would argue, however, that to view MUDs, MOOs, and so forth as simply games maintain a focus on structures like rules and architecture which curb experimentation and risk-taking. With such an expansive capacity for creativity, identity formation, and socialization, MU\*space quickly exhausts the limits of spatial models. Envisioning *PhronesisMU* as a MU\*place, however, we focused on those elements that reinforced those rhetorics of place which privilege landscape, home, community, and collaboration.

The relationship between space and place is theoretically complex and well beyond the more pragmatic scope of this essay. For the sake of review, however, it is worth noting that this essay relies on theories of place culled from humanist geography which situate place as always preceding space (see Yi-Fu Tuan, 1979). Individually or collectively felt, our sense of place informs our perception of the world as well as the ways we derive meaning from it. Unlike the rigidity and homogeneity of space, place is fluid, overlapping, and at times colliding. Doreen Massey (2005) pointed out that navigating this “throwntogetherness” of place demands one be “open to the challenge of negotiating a here-and-now” (p. 140). Placemaking, according to Massey, is therefore a radical and conscious act (185). With regard to composition, one only has to

consider Dobrin's (2001) ecocritical writer as one who is empowered with the capacity of self-emplacement. Constraints of space, such as those imposed by our now-everyday writing and instruction platforms inhibit this ability. One only needs to think about struggles against over-reliance on auto-correct and other prescriptive capabilities. While helpful, these functions also come with rhetorics that position the technology as yet another load-bearing wall.

How does the developer-as-author impart the potentials for place into the digital? If space, according to Tuan, is written in accordance with the prevailing perceptions of beauty, what is the process by which a sense of place is nurtured? In these places the nature of community may be complicated, even perhaps tenuous. Perhaps more elusive, the player's sense of place peers through in the Being-in-the-worldness as they moves towards a Becoming-with-the-world. With respect to process-relational philosophy and nomadology, such abstruse concepts may seem very far removed from the discourse of composition, at least as it has been developed in existing studies. Attempts to radically rethink space and place can be essential to understand the full expressive potential of aesthetics, which has begun to emerge in the recent state of the art.

Simply put, the electronic spaces in which we work, socialize, and play are dominated by powers that seek nothing less than incorporating publics into a techno-ecology driven by profit. If the internet was once considered a frontier, it has now one that has almost entirely been colonized by platforms aimed at rendering every facet of our everyday experience into exploitable data. Rhetorics of place, on the other hand, are more uncertain and unreliable. They are the risky rhetorics of collaboration and community-building within a foreign and at times hostile landscape. A return to obsolete spaces offers a return to a wilderness that is both wondrous and terrifying. With its archaic commands and obsolete, text-based interfaces, MU\*space very much seems like an alien world to many. Yet this is a world where a passive visitor can become an active explorer or, better yet, a participant complicit in the act of placemaking.

The pleasures of place come from opening to the "throwntogetherness" of the relationships that fabricate it—wrinkles and all. Rather than its conquest, it is the cohabitation with the processes and relationships that compose it that provide the meaningful experience. Both lauded and lamented, the author submits herself to the intervention with the work. The most carefully crafted objects are subject to being pilfered, cherished spaces vandalized, but also shared, and cooperatively experienced. But isn't this the community we desire? Don't these interventions, as intersections in the process of Becoming indicate their vitality?

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Look
Agora(#0RLJ)
A spacious open plaza of modern design, the Agora
is crowned in fern and ivy. A stalwart pergola,
anchored in the center of the cobblestone floor,
stubbornly resists the pull of the prehensile
wysteria whose luscious purple blooms conceal the
homes of several nesting wrens.
Contents:
Pocket(#59Ten)
Obvious exits:
Parthenon <E> and Garden Path <S>

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Figure 3: *PhronesisMU* screen capture

The goal of *PhronesisMU* is to invite the sharing of experience through a unique and experimental platform that draws on now rarely used technical architectures that were built to encourage this type of interaction. What we desire from *PhronesisMU* is an opportunity for participants to devise those structures themselves as much as possible. As a small and niche experiment, we hope that it grows to attract a following similar to that of *MediaMOO* and others populated by the Computers and Writing community. In opening the space to shared creative investment, constructions in both code and text, and the sheer thrill of exploring the results of that work, we are excited to see what comes next. Our hope is to continue to push for collaboration through online interaction and via local gatherings of writers, researchers, and creators at conferences and in smaller more local venues. Through the interactions of these different insights, skills, and ideas there is obvious potential for continued growth in both scholarship and community. What's more, we hope that this return to MU\*space presents more than a simple nostalgic look back (though we admit it is hard to resist these temptations) but, as a complementary facet of our digital lifestyle, illuminating the myriad potentials that these collaborative spaces still offer. Ultimately, *PhronesisMU* is one part a labor of love, an homage to people that have built communities that cherish the creative and honor the past, but it is also a look forward to the vistas ahead—even if that occasionally entails rejuvenating the obsolete.

## Postscript: Accessing *PhronesisMU*

For more details on how to access *PhronesisMU*, please contact the authors directly via Twitter at @textandhubris and/or @krispurzycki.

## References

- Aspnes, James. (1989). *TinyMUD*. [Computer software].
- Bartle, Richard. (2004). *Designing virtual worlds*. Berkeley, CA: New Riders Press.
- Bartle, Richard. (2009) From MUDs to MMORPGs: The history of virtual worlds. In J. Hunsinger, I. Klastrup L., & M. Allen (Eds.), *International handbook of internet research*. New York, NY: Springer.
- Bartle, Richard, & Trubshaw, Roy. (1978). *MUD1*. [Computer software].
- Bruckner, Amy, & Resnick, Mitchel. (1993). *MediaMOO*. [Computer software].
- Certeau, Michel D. (1984). *The practice of everyday life*. Berkeley CA: University of California Press.
- Christensen, C. (2013). *The innovator's dilemma: When new technologies cause great firms to fail*. Boston, MA: Harvard Business Review Press.
- Colley, Steve, & Thompson, Greg. (1973). *Maze War*. [Computer software].
- Crowther, William, & Woods, Don. (1976). *Colossal Cave Adventure*. [Computer software].
- Curtis, Pavel. (1990). *LambdaMOO*. [Computer software].
- Dibbell, Julian. (1998). *My tiny life: Crime and passion in a virtual world*. New York, NY: Henry Holt and Co.
- Dobrin, Sidney. (2001). Writing takes place. In C. Weisser, & S. Dobrin (Eds.), *Eco-composition: Theoretical and pedagogical approaches* (pp. 11–25). New York, NY: SUNY Press.
- Gimse, Geoffrey, & Purzycki, Kristopher. (2018). *PhronesisMU*. [Computer software].
- Haynes, Cynthia, & Holmevik, Jan. (2001). *High wired: On the design, use, and theory of educational MOOs*. Ann Arbor, MI: University of Michigan Press.
- Lebling, Mark, Blank, Mark, Anderson, Tim, & Daniels, Bruce. (1977). *ZORK*. [Computer software].
- Massey, Doreen. (2005). *For space*. London, UK: Sage.
- PennMUSH*. (1992). [Computer software] Available at <https://www.pennmush.org/>
- Shaviro, Steven. (2003). *Connected: Or what it means to live in the network society*. Minneapolis, MN: University of Minnesota Press.
- Tuan, Yi Fu. (1979). Space and place: A humanistic perspective. In *Philosophy in geography* (pp. 387–427). Dordrecht, Netherlands: Springer.
- White, Steven, & Curtis, Pavel. (1990). *TinyMUD*. [Computer software].