Re-Locating Literary Study: The Possibilities and Pitfalls of VRML

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The emergence of Internet technologies into the academy promises to shift the way we go about our studies and teaching. We are seeing more and more courses shifting syllabi and discourse onto email, listservs, the World Wide Web, and into other technologies emerging on the bleeding edge of communications technology. One of these emerging technologies, the Virtual Reality Modeling Language (VRML), and the browsers and authoring tools being developed to use this standard, brings the promise of three dimensional space to the Internet. Until the explosion of the World Wide Web in 1995, the Internet has been primarily a text-based medium, and even with the proliferation of the Web, texts primacy as the lingua franca of Internet communications still remains central. But with the advent of VRML and its cousin technologies, the metaphor of space in the term cyberspace becomes a real potentiality. This ability to create virtual spaces easily transportable across the Internet opens the doors for many disciplines, not least of which are the disciplines of the humanities.

In my presentation, I propose to explore VRML and the possibilities it offers in humanities computing, especially as related to literary studies. The presentation will cover briefly the history of the development of VRML, offer a survey of its current uses in both the hard sciences and the humanities, and examine limitations of the VRML standard as it is currently written. The main focus of the presentation will center on three prototype applications. By demonstrating prototypes in two areas where VRML might be used in literary study – drama and literary history – I hope to show some of the potential advantages and limitations of this three dimensional modeling standard as well as give the attendees a taste of what the future of three dimensional computing in the humanities might look like given today's technology. Using VRML-based applications as models, this presentation provides a common starting point for scholars to begin to consider uses of virtual reality and three dimensionality in their own study of computing in literary research.

Definitions, history and current trends

The Virtual Reality Modeling Language known as VRML (and sometimes pronounced *vuhr-muhl*) is an ASCII-based language specification that allows for the description of three dimensional spaces, a language standard that can then be interpreted by rendering engines on different software platforms. VRML allows detailed description of three dimensional spaces. With this standard, one can create a world in three dimensional space as rich or as plain as wanted, changing light sources and direction, object textures and complexity, size and location, etc.

The ASCII nature of the language allows worlds described in VRML to be compact enough to be reasonably accessible across the Internet since the client-server relationship underlies the basic premise of VRML 1.0's portability. A complete VRML file, marked with a .wrl extension, resides on a server and is accessed and downloaded across the Internet through a client browser, either a two dimensional browser like Netscape or a three dimensional browser like WebFX or Fountain. The VRML file is only rendered by the browser when completely downloaded to the local computer. (The presentation will talk in more detail about the advantages and disadvantages of this kind of use of the client-server model; for the moment recognize that this model does not allow for person to person interactivity within that three dimensional space.) The ASCII nature of the VRML file allows it to be relatively compact and allows it to be portable across platforms, much like HTML.

This portability across software platforms is one of the strongest advantages of VRML. For example, a three dimensional world created in a DOS-based AutoCAD application can be translated from that proprietary software's language into VRML, allowing the file then to be ported across to a MAC-OS system, a Windows system, an X-Windows system, etc. VRML developers are not restricted then to development on any single platform but are free to develop in potentially any computing environment familiar to them.

The presentation will also include a discussion of the history of VRML development as well as offer an update on the state of VRML and its cousin-technologies as of June of 1996. Given the youth of VRML 1.0 as a standard, the current movements to develop VRML 2.0, proprietary develop-

ments of VRML+, the development of QuickTime VR, and potentially other cousin-technologies, it serves the purposes of this proposal and abstract simply to mention that the presentation will discuss up-to-date issues and trends as related to these technologies.

VRML prototypes

This presentation will use as its focus two prototype applications developed in accordance with the VRML 1.0 standard. These prototypes will serve as examples of the kinds of humanities computing possible with VRML in a discipline not immediately thought of when talking about virtual space and virtual reality: literary study.

Some literary genres and forms seem quite natural candidates for study in a virtual space, however. Their creative and literary expression work within and evoke three dimensional space as part of the fabric of their textuality. Other areas of literary study are not as readily adaptable to movement into three dimensional, virtual space. This presentation will walk through two prototypes that illustrate how virtual reality applications might be developed in literary study and teaching, that demonstrate the possibilities and limitations of current technologies based on VRML, and that suggest directions literary studies and instruction might take as the technology moves us further into a virtual reality environment distributed over the Internet. Please bear in mind that these application designs are only prototypes developed with bleeding edge technology. Seeing the reality of that bleeding edge has value, however, despite the potential pain to both presenter and viewer. (Rest assured, at the same time, that I will prepare and test the technology to be demonstrated in this presentation.) Keeping in mind the nature of this new, bleeding edge technology, the presentation demonstrates these two prototypes by in order of their natural affinity to being located in three dimensional space.

Drama studies

When we think of three dimensional space and literary studies, we often find that drama comes first to mind. By its dual nature as a performance text, drama resides in a liminal space, half-way between text and performance, between imaginative, virtual space, and concrete, physical place on a stage. This duality as text and performance object allows drama to lend itself to computer applications in three dimensional space. For some time now, scenic designers have been using AutoCAD software to aid in designing sets. Directors have used the same software to help them visualize blocking and stage focus. In fact, stage models have been around for centuries. Today, however, a few designers are beginning to turn to VRML as a means of describing the three dimensional spaces of their set designs. We might as easily bring the same technology into our teaching and studying of drama as literature. The presentation hopes to show one way this might be done.

With an appreciative nod to the host nation and city, I have chosen to use in this demonstration Henrik Ibsen's *The Wild Duck* (1884) as the subject of the first VRML prototype. (I spent the 1992-93 academic year at the University of Oslo as a Fulbright Scholar studying Henrik Ibsen's major prose drama with the help of Dr. Hans Skei and Dr. Vigdis Ystad.) How might the study and teaching of Ibsen's play be enhanced through VRML technology? Ibsen's experience in Bergen was as a dramaturge, a technical director of sorts. He began to learn during his years working in the Bergen (at Den Nationale Scene) about the space and place of the theatre, about sight lines and acoustics, about entrances and exits, and other elements of stagecraft. The technical theatre Ibsen learned in Bergen plays out in his dramatic work in the explicitness of the stage cues and instructions he gives in the texts of his plays. Ibsen's texts are full of these explicit and implicit clues about props, stage design, exits and entrances, lighting, movement, etc. By adding to our study of Ibsen's craft a movement into a virtual place rendered according to the VRML standard, we are able to re-locate one aspect of our study of Ibsen's drama and to shift our perspectives on that drama in new ways.

This part of the presentation will revolve around a demonstration of a virtual space designed to represent the set as indicated in Ibsen's text of *The Wild Duck*. Through the prototype the presentation will demonstrate the capabilities of VRML to hyperlink between three dimensional worlds/spaces and HTML documents. Additionally, the prototype demonstrates the range of behaviors allowed by VRML 1.0 and the limitations of the VRML 1.0 standard. The prototype will also present other uses of virtual spaces to teach *The Wild Duck*, including the importance of Ibsen's own virtual space within the play's symbolic structure: the attic. Finally, the prototype will show how this type of technology advances earlier efforts to bring computing to drama studies. A couple of years ago, Eric Johnson developed software called ACTORS, designed as a tool to process the electronic text of a play in order to tell which dramatic characters are on stage simultaneously and thus to suggest possible doubling of roles for a performance. Johnson suggested at the time that additional literary and dramatic insights might be gained if researches noted which characters are on stage together, when, and how often (Johnson, 399). With VRML, we might extend Johnson's work into a three dimensional visualization, locating

those actors on stage and giving the student or scholar (as well as the theatre professional) a chance to place those actors and, in so doing, to visualize the performance text. Pushing the concept even further, this presentation will suggest how bringing Ibsen's play (and any other drama for that matter) into a virtual space allows students and scholars to study interactively the complexities of set design and its impact on theatrical metaphor and dramatic meaning. Unlike film, virtual spaces created in VRML allow users to interact more directly with the objects on the virtual stage. It is hoped that with the demonstration of this prototype the presentation will give the attendees a chance to see directly what can happen when we re-locate an inherently three dimensional literary text into a space and place, albeit virtual.

Knowledge spaces of literary history

The second prototype of the presentation moves from a naturally three dimensional literary genre like drama to one less easily applied but perhaps even as valuable. Writers write in a place, in a location. As literary and cultural historians have often said, writers do not write in vacuums but are very much products of cultural place and location. This second prototype will demonstrate a means of re-locating literary history in a virtual place. The prototype will center on a symbolic, three dimensional recreation of Concord, Massachusetts during the 1840s and 1850s and try to show how the writers of what is called the American Renaissance – Emerson, Fuller, Hawthorne, Melville, and Thoreau – were themselves located in a small New England town. The virtual space, a layout of Concord at the time, will allow students to interactively hyperlink from places within that space like Emerson's home, the House of the Seven Gables, or Walden Pond to critical writings about the relationship of these authors, digitized versions and excerpts of their works, and multimedia presentations of the locations as they are today. Demonstrating this prototype, the presentation turns the focus to yet another way virtual reality technologies distributed across the Internet might advance computing in literary studies.

Conclusion

Book-based literary studies may be enhanced by locating aspects of that study in three dimensional spaces, spaces that allow for asynchronous and interactive learning in ways that break out of traditional pedagogical models and into new places and new spaces. Clearly, literary studies are not the most readily ideal place for talking about three dimensional humanities computing applications. The work of literary studies is in texts, books, the printed word and image, in text-based communication. We should not limit that study, however, to the two dimensional space and page alone. Certain aspects of literary studies lend themselves to the capabilities of three dimensional, virtual reality environments. By re-locating the learning in a virtual space, we give students and scholars new tools for understanding the impact of literature in three dimensional space. We return literature, in part, to the three dimensional culturally connected space in which it was written and make those cultural connections explicit to students. The broad scope of cultural studies that now widens our perspective of literary construction and that asks scholars to return writers to their place within a culture might benefit from computing tools that re-locate literary texts within three dimensional spaces.

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NOTE: A more extensive bibliography will be added to my personal VRML pages available at http://www.unc.edu/~chad_k/vrml/vrml.htm.