

DIGITAL SCRIPTS ON A VIRTUAL STAGE: THE DESIGN OF NEW ONLINE TOOLS FOR DRAMA STUDENTS

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ABSTRACT

Students interested in studying scripts might have a variety of goals and requirements, in part depending on whether they are actors, directors, or literary scholars. In each case, the needs of the students differ slightly, although all are typically involved both in reading the text and watching performances. This paper describes the design of an online system that introduces another alternative for all three groups: the ability to watch the script play itself out dynamically on a virtual stage. By combining this virtual playback with a number of tools for selecting relevant passages and controlling the motion, as well as drawing on any available encoding in the text, this online prototype will have the potential to provide an instructional experience that brings together some of the best features from the printed page and the live staged or filmed production.

KEYWORDS

Kinetic text, drama, interface design

INTRODUCTION

For students of drama, there are a limited number of traditional options available for reading and experiencing play scripts. To begin with, there is the static printed script, which allows for reading and annotation, as well as reference to scholarly apparatus such as cast lists and footnotes and historical glosses. At the other end of the spectrum is the live staged production or film version, which allows the student to see how a particular director and cast have interpreted the play. At some intermediate point is the audio version, which can provide the listener with a dynamic experience that is divorced from issues of staging. However, with the ready availability of digital

scripts, the possibility presents itself to create further points on the spectrum.

Digital online texts are now widely available for many plays. Many of these texts are in simple ASCII format (e.g. Project Gutenberg) while others have been encoded using various schemas designed in Structured Generalized Markup Language (SGML) or eXtensible Markup Language (XML) (e.g. the Internet Shakespeare Editions). Some of these encoded texts are further compliant with the standards established by the Text Encoding Initiative (TEI). The existence of these digital resources creates an opportunity for the creation of online environments that can be used by students who are interested in reading and studying the texts. Within the realm of digital environments for various purposes, the design of new systems for working with traditional materials holds tremendous promise, both for the access of documents as well as for the creation of new tools that can be used in working with individual documents. Gibson [1] outlines the concept of affordances, which are the perceivable opportunities for action in the environment for a given viewer.

By developing new online tools for working with digital texts, we can in some instances offer new affordances—new opportunities for action—that may be related to opportunities that were previously available, but are nonetheless different enough that the experience of the user is significantly changed [2]. This paper describes the design of a system called “Watching the Script” for working with digital versions of stage scripts, where the goal is to provide the student with a number of new opportunities to read and study the script, both as a static

object and in the form of a dynamic playback of the text as it has been blocked out on a virtual stage.

PREVIOUS LITERATURE

Bork [3] outlined a series of possibilities for the creation of kinetic text, suggesting that important factors to consider in the design of methods for displaying text on screen were legibility, memorability, and motivation. He proposed that a comparison could be made between an instructor working on a blackboard and a system alternately displaying digital texts and images. However, he also emphasized that since timing is such a crucial component in successful display of kinetic text, the best comparison might be between digital text and film.

Small [4] describes a system of microtext columns that provide a 3-dimensional virtual environment for people studying Shakespeare's plays. By allowing the user to navigate the system by flying past the columns in three dimensions, Small's prototype provided affordances equivalent to zooming in and out from the text, so that it was possible to achieve both an overview and reading view by selecting an appropriate distance. The columns were also provided with side views, which contained annotations that were visually associated with the text they were annotating. By moving back and forth around a corner, the reader was able to move efficiently between the original text of the play and the annotations.

Ruecker et al. [5] describe a system that represents multiple views of a text simultaneously. Some of these views provide a means for examining important macroscopic features of the text, without necessarily allowing for the actual text to be read. These prospect – or panoramic – views of a text can provide useful triggers for what someone might want to read more closely.

In the application area of digital scripts on virtual stages, the emphasis has been largely on the virtual staging rather than on the script *per se*. One example is the Scenario system [6], developed in conjunction with the Internet Shakespeare Project and distributed on CD. Scenario provides the user with a virtual reconstruction of the Globe stage, with characters that can be positioned to carry out simple activities, such as falling over dead in various ways. The purpose of Scenario is to help students envision the blocking of the script (where the characters are on stage) in its original setting.

DESCRIPTION OF “WATCHING THE SCRIPT”

The basis for the “Watching the Script” online system is an interface prototype developed to take advantage of the overviews that can be provided by microtext columns that represent an entire document, coupled with various forms of reading view and associated tools for manipulating the display [5], [7]. By providing a microtext display, the system allows the reader to see at a glance a number of important document features, such as how the script breaks into acts and scenes. Combined with tools for

selecting the lines spoken by individual characters, or for selecting scene locations, the microtext overview can also serve as a means of understanding which characters are on stage at what points in the script, where the various actions take place, and the interrelations between characters and settings (Figure 1).

In addition to the microtext display, the system also provides two other means of viewing the text. The first is a reading view, which is synchronized with the microtext but is at a scale that is appropriate for reading. By scrolling through the microtext, the student is able to also scroll through the reading view. The process also works in reverse, so that scrolling the reading view also moves the cursor associated with the microtext. Attached to both the views are playback controls, which allow the student to set the text to automatic scrolling at a rate that is under user control. One option is therefore to choose selected passages in the entire script, using the selection tools, then read the script in the scrolling view as it moves past at a steady pace.

The core strength of the system, however, lies in the integration with the third display of the text, which is related to the movement of characters on a stylized stage. As the text scrolls in the reading view and the related cursor moves along the column of the microtext, the same text plays itself out on the virtual stage, following the movement of each character. While moving, the characters are represented by coloured dots. While standing to speak, the dots are labeled with the character names. Characters while not speaking remain in place on stage, but are grayed out in order to retain the reader's focus on the current speaker.

SCENARIOS OF USE

As the prototype online system nears completion, plans are in place to carry out usability testing with three different groups: actors, directors, and literary readers. In each of these categories, there are two subgroups: students, and working professionals. Initial usability will be conducted using working actors and literary students. Subsequent development on the blocking component will increase the functionality for directors, at which time a study will also be undertaken with student directors. This second phase will be more complicated, involving not only the various playback affordances, but also the interface for creating and recording character movement and location. Finally, it may prove possible to connect the virtual stage of “Watching the Script” with a 3D virtual environment populated with animated characters, so that the blocking instructions designed on the 2D stage could be transferred to movements in 3D. The attempt to provide animated characters and more realistic stages introduces a number of technical and cultural challenges, including the question as to whether this location on the spectrum has any virtues that are not already well-established by staged versions and films.

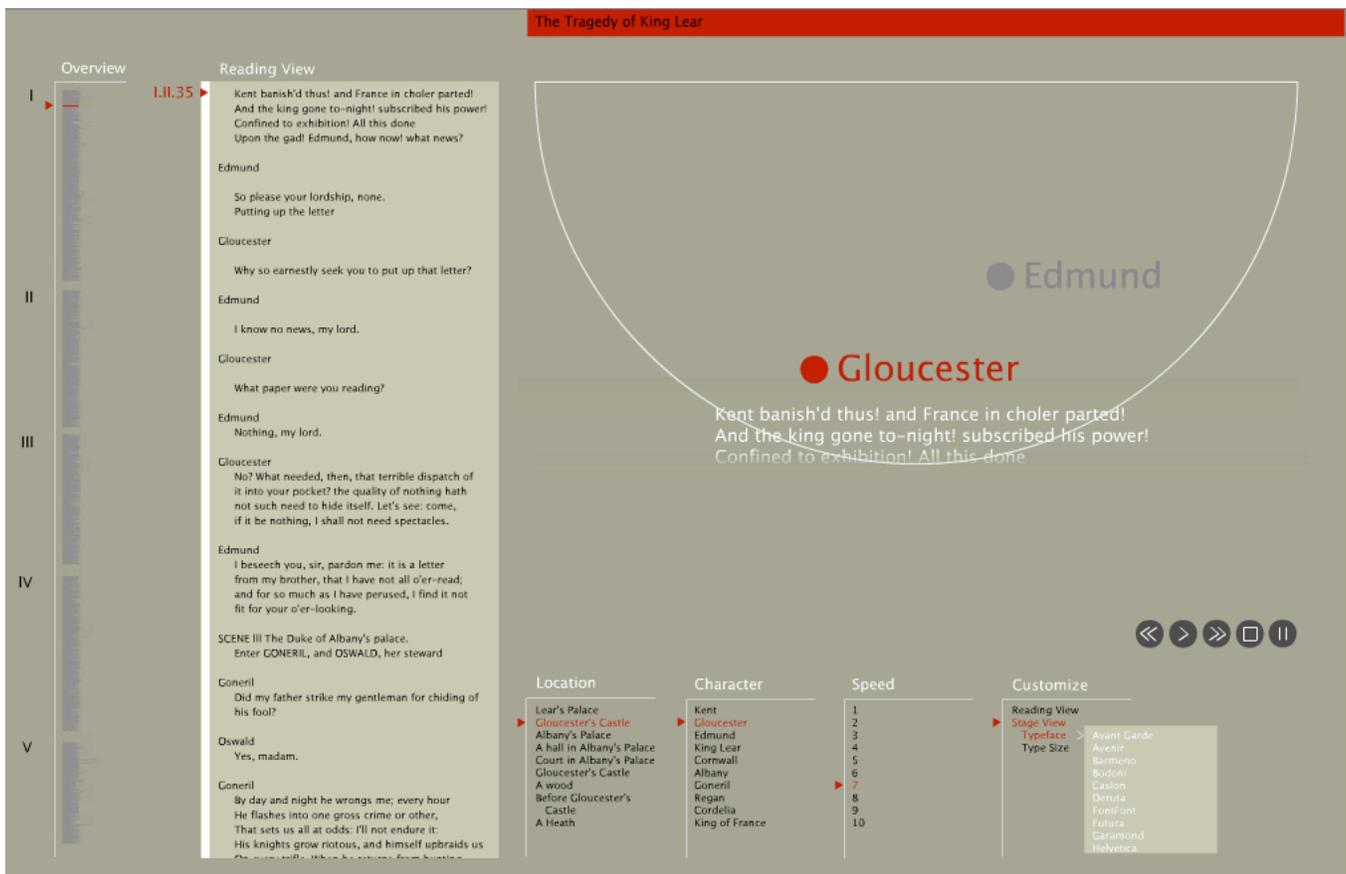


Figure 1: The “Watching the Script” interface combines multiple views of the text with tools for manipulating the dynamic playback on stage.

Scenario 1: Actors

For actors, one of the fundamental necessities is to learn lines. Not only does this require memorization of one’s own lines, but it also requires memorization of cues, which may consist of lines spoken by other actors, but may also be provided in the form of stage business, and in any case are subject to issues of timing. How long, for instance, does the other dialogue take before it is time for the actor to speak again? What has been happening in the interval? Traditional methods of learning lines therefore involve both reading either silently or aloud to oneself, and recruiting partners to read the other lines in order to help with the timing and cues. During rehearsals, it is also common to spend time on the actual stage with the other actors, so that blocking can be arranged and remembered in conjunction with the speeches.

Using the “Watching the Script” system, the actor is able to accelerate the process of learning lines by working in the first instance with text that is associated visually with the blocking on stage. Timing issues are also addressed, since the rate of the playback of the text can be adjusted to approximate the reading speed of the characters. Using the various selection tools available, the actor can choose to play back only those lines he or she will be speaking,

or all lines spoken in a given scene, or all lines spoken in a given location.

Scenario 2: Directors

Directors, whether students or professionals, are faced with a different set of tasks and decisions than those confronting the actors. The director needs to consider where the actors enter and leave the set, where they stand while delivering their lines, and which lines will be cut from the speeches of which characters. The director also needs to figure out whether or not it is possible to double-cast characters, so that for logistical or budgetary reasons one actor plays more than one role. In such cases, it is necessary to configure the script in such a way as to not require the double-cast actor to appear on stage in both roles at the same time. It is also necessary to make provision for sufficient time between appearances for the actor to effect any necessary changes in costume or makeup.

By having an online virtual environment, the director can experiment with a variety of blocking strategies, moving characters into different configurations to get a preliminary sense of the possibilities. The director can also modify the script, trying out options in terms of the numbers of lines assigned to various characters. Finally, the director can consider double-casting issues, by

highlighting in the prospect view the lines spoken by different characters in order to observe their proximity in the script.

Scenario 3: Literary Scholars

Not everyone who reads a play is planning to direct it or act in it. Literary scholars have their own needs, which may involve some of the same features required by actors and directors, but which may also extend into areas that are either altogether outside the needs of the others, or else extend those features in particular ways. For instance, the scholarly apparatus required by the literary scholar may reflect the annotations necessary for the actor or director, but may also vastly exceed those annotations in number and length.

Attempting to accommodate the different potential users in a single system complicates the design. However, with careful attention to the various scenarios of use, in combination with an iterative approach to usability testing and redesign, it should be possible to find an optimum solution.

DESIGN ISSUES

The issues identified through the scenarios include the need to provide some means of controlling the speed of playback, so that actors and directors are able to get a sense of the timing of the play. There is also a requirement for selecting the lines of more than one character at a time, so that directors can consider double-casting (using a same actor for multiple roles). These controls have been located across the bottom of the panel. Finally, for all three groups, but in particular for literary scholars, there is the need to provide some form of scholarly apparatus, including but not limited to annotation.

However, independent of the proposed user, there are several generic features that also needed to be included in the interface. First of all, there had to be the availability of text in different forms, to allow it to serve different functions. Our solution was to provide various scales of text, so that the microtext could be used to gain prospect on the entire play, the reading text to view a section at a legible size, and the staged text to get a sense of the dynamics of the action.

Within these broader generic functions, there was the further necessity to decide how much detail needed to be included on the stage itself. Should there be an attempt at providing an audience point of view, for instance, with the stage slanted at an angle from the viewer, and the lines displayed in the air, or should the point of view be strictly aerial? Once the viewing angle is set, should the stage have realistic features, or should it be entirely stylized? Finally, to what extent should features like font, font size, stage colour, and so on be under user control? In the current prototype, design for simplicity is one guiding principle, and usability is another. As a result of the

intersection of these criteria, font and font size are variable, but font colour and stage colour are not.

Given the decision to adopt a stylized stage, there is a further decision to be made about its form. Should all stylized stages be the same, or is it useful to allow the user to control certain aspects of the stage? Relevant aspects might include the stage shape and dimensions. In the former case, if a choice of shape is a good idea, it may be sufficient to provide a picklist of possible shapes. In the latter case, if a choice of sizes is a good idea, it may be sufficient to provide a number of choices in both width and depth. On the other hand, it may prove impossible to adequately address issues of shape and size with pre-determined stages, in which case a tool would need to be created to allow the user to generate stages of any shape or size. While such a tool provides the user with a great degree of flexibility, it also entails some technical challenges, and it may also be unnecessarily detailed for the purposes of most of the users. Here is an area where user information is essential to the design decision.

Further decisions needed to be made with respect to other conventional features of a stage, including in particular lighting and furniture. The current system includes neither, although it will be possible at a later stage in the prototype to include provision for both. The technical issues, however, increase proportionately in complexity with every new proposed feature, since it will be necessary to determine, for instance, whether a character can or should walk over a piece of furniture, or sit or stand on one while delivering lines (guidance in these matters might be gleaned from the literature on the situational intelligence built into game engines). One possibility is to give the various items an optional “wraparound” characteristic, which would either allow characters to intersect on stage with them or not.

TECHNICAL ISSUES

The application is designed to provide the user with a new way to experience dramatic performance. The user can read along with a play in the scrolling reading view window, while at the same time watching the action unfold on stage in the stage view. The user may also jump to any part in the play by clicking the overview section, which represents the play in its entirety, with each character’s lines being represented by a color specific to that character. The color also corresponds to the character’s color on stage, and the color of that character’s dialogue in the reading view. The goal is to have a totally customizable user experience, where the user is able to change the speed, colors and positions of the characters on stage, all while watching the play unfold.

In order to make the system as useful as possible, it is necessary for it to have two features. First, it should be available online, so that it can be launched in any of the standard internet browsers (the current prototype has been

developed in Flash). Second, it should be able to read and display any online digital script, so that users are not restricted to the small subset that could reasonably be provided by the designers of the system. Since scripts harvested “from the wild” might lack some of the more sophisticated features available in those that have been specifically encoded for use with the system, it should also be possible for the user to provide additional information that could augment any script.

One of the most significant technical challenges that we faced finding a way for the program to coordinate and synchronize the interaction between the three views of the text. This hurdle was overcome, in conjunction with an object-oriented coding design, using a technique called hit detection. An invisible clip at the top of the reading view section constantly records the current clip passing through it. That information is passed to a function which determines which stage character to move, and to how to coordinate each view.

Another challenge to overcome was the construction of a unique reading view clip for the current play, which might allow appropriate spacing of the speeches in the reading view, even though there can be no set vertical dimensions for the text boxes housing each speech (as the speeches vary in size). Since the size of each text box dynamically changes to fit the speech inside it, and Flash has no way of determining the exact size of dynamically created text fields, a formula was derived to calculate the approximate size of each text field, depending on the size of the font, the spacing between characters, and the (set) horizontal length of the text field.

Two of the more difficult problems we have further encountered have involved the parsing of complex XML files, and the large size of the reading view caused by the length of plays we are working with. Both these problems have produced setbacks which have required us to re-think the way we were going to build the program.

Where parsing of information is concerned, the problem we encountered was that even though our plays were marked up in TEI conformant XML, there was (valid) variation in the particular syntax of each document. Rather than overload the parsing complexity in our system, our solution was to pass texts through an XSL transformation that could address the variations and produce a canonical (although vastly simplified) form.

The problem that arose concerning the reading view was that the system was producing one very large clip housing all the current play’s speeches, which caused the computations needed to synchronize the views to slow the system to an untenable pace. For instance, *Romeo & Juliet* produced a reading view clip over sixty thousand pixels high. Since the reading view moves using an easing function (a set of mathematical calculations that, when applied to the clip, cause it to move in a smooth manner),

the size of the clip made it impossible for Flash to move the clip the way we had intended. Our solution was to only house the speeches for the current scene in the reading view, and load the previous or next scene as the first or last speech clip fully passes through the hit detector clip. This approach drastically reduced the size of the reading clip, allowing for a much more acceptable fluidity of motion.

CONCLUSION

The “Watching the Script” prototype is an innovative approach to studying scripts by reading them in a kinetic online environment with multiple simultaneous views, including a stylized stage. This project has potential benefits for a variety of readers, including actors, directors, and students of plays.

FURTHER RESEARCH

We are planning next to conduct usability trials for the three groups identified in the scenarios. These usability trials will attempt to capture appropriate measures of performance and preference for actors, directors, and literary scholars, using on the one hand only the traditional methods of study, and on the other the traditional methods supplemented with the “Watching the Script” online system.

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