Digital Scenography

Bringing the theatre into the information age

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Computer tools in scenic design have certainly become widespread. *Computer-aided design* (CAD) tools and skills are rapidly becoming standard rather than exceptional. For years, stage designers sending their designs to scenic studios have employed technical-drawing applications created for architects. More recently, preliminary sketches, designs for painted drops and detailed drawings of props are being created using painting or photo manipulation programs such as Painter or Photoshop. More and more we are seeing designers use 3D modeling software to create scenic models that had previously been made with cardboard and balsa wood. These 3D applications are then used to render photo-realistic scenic sketches with incredible detail and accuracy.

We are also seeing a battery of commercial software tools created expressly for the theatre or aimed at designer consumers. Many applications that are specifically created for other professions now include plug-ins or templates that are theatre specific. Many technical drafting programs now include templates for stage lighting designers. Modeling and rendering programs include virtual light sources that are patterned after actual stage lighting instruments and allow the designer to easily create storyboards that correctly reflect the use of real lighting equipment. We also now can benefit from new commercial services geared specifically to the scenographer. Firms now exist that will create 3D computer models, storyboards and renderings from designers' drawings. Several new companies use super-sized printers to create scenic drops from sketches or computer files sent to them by

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designers. This advance is significant, not only from the practical standpoint of effecting the cost and building time for a production, but by the fact that an important collaborator, the scenic artist, is eliminated from the process. In the future, designers will have to learn to adapt to a technology that translates their sketches directly to the stage rather than communicate them to another sensitive artist for realization.

Another sign of the emergence of computer skills is the job market for new designers. A majority of job descriptions within academia and resident theatres now list CAD skills as a requirement rather than an option. In some cases, theatres have followed the lead of other businesses by opening new positions for computer technicians to maintain their computer facilities. In order to respond to these new demands of the job marketplace, theatre training programs now routinely include a curriculum designed to impart CAD skills to future designers. The area of lighting design was the first to use computers in actual production. Because of the quantitative aspect of lighting design and the size of the databases created by modern lighting plots, computers are a natural tool to manage and perform lighting cues. Over the past twenty years computerized lighting control has almost completely replaced manual systems in the theatre. In more recent developments, lighting designers are using faster computers, and affordable, user-friendly applications to create accurate storyboards on the computer thereby turning it into a tool in the planning of a production. The evolution of *computer-generated images* (CGI) in scenic design has taken an opposite tack. Now firmly established as a scenographic tool in the planning of productions, CAD scenography is currently moving from that stage to that of being a participating ingredient in the final production. Increased use during recent years has given us some perspective on how CAD tools effect the everyday work of designers. Today, we are learning how the use of CGI in production might effect the end product of a theatre production.

Throughout the theatre's history, advances in technology have driven many of the advances in scenography. As the science of stage lighting moved forward from flame to electric light and further progressed to incorporate increasingly sophisticated control, the nature and lighting design changed enormously. Subtle and instantaneous changes in the quality of light allow designers to increase the number and complexity of cues. The ease of operation makes it possible for lighting designs to reflect subtle changes in the time of day, psychology of the characters, or mood of a scene. The most advanced lighting systems allow a single instrument to change intensity, color, texture, and move to a new area of focus affording designers nearly complete flexibility.

Computer-controlled and motorized rigging systems make it possible for scenery to move higher and lower, travel upstage and downstage, onstage or off, and rotate to any angle. Radio-controlled props provide an amazing array of special effects. Sound effects are routinely generated and digitally mixed with computers and entire sound systems are now similarly controlled. Other advances have come as a result of changes in the prevailing cultural artistic style. Even a cursory examination of art within the context of historic periods shows that scenography is closely linked with these styles, reflecting and defining the tastes of the age. During the realistic period of the early twentieth century, the theatre kept pace with realistic scripts and stagecraft. Concurrent with movements of romanticism, expressionism, symbolism and any other, the theatre incorporated the prevalent style and created works that spoke in the language of its contemporary audience. Recently, however, we may be in a period in which scenography has not kept pace with popular culture. I find the disparity most obvious in the body of new play scripts.

We now are in a position wherein we have a new generation of playwrights that did not grow up in and around the theatre. Instead, they have grown up in front of the television or watching movies. As a result, many new scripts resemble screenplays more closely than do older, more traditional play scripts. Increasingly rare is the stagecraft of writers such as Neil Simon or Arthur Miller who cunningly set an entire play within a single locale, work a script to allow time for costume changes and leave any shifting to the act break. Many newer scripts call for a complete new setting for each of many short scenes, changing both the time and the place rapidly with little regard for the physical limitations of production. These plays reflect current culture in that they are rich in information and use a multitude of visual images and multiple storylines. Information is typically presented in high-speed bursts and in pieces that have to be put together by the audience. They do not follow the more familiar and comfortable linear style of storytelling of the past. This new style of presentation is similar to the dissemination of information through electronic media and is suited to the talents of a population who can simultaneously watch two television shows and a football game while avoiding commercial breaks. We can see evidence of this saturation everywhere we look. Magazine art and advertisements, television programs, commercials and promotional graphics, web pages, music videos, movies, and even billboards along the highway.

How has modern scenography responded to the problem of staging that are, in effect, screenplays being produced on the stage? A newspaper story appearing in London's *The Guardian* concerning our new high-tech production of *Shakespeare's A Midsummer Night's Dream* quoted Anthony

Rowe, design coordinator of the Royal Shakespeare Company as saying that "*The trend at the moment, in fact, is for more pared-down sets which let the beauty of the writing come through*[1]." This is, in fact, a trend that has been present in our theatres for a long time; but why? Out of necessity, during the past couple decades, modern scenography has responded to the forward movement of our popular culture by producing increasingly complex plays with an almost Elizabethan stagecraft. Production teams are faced with the problem of having to create and realize a production design comparable to that of a feature film, but with money and manpower budgets only a fraction of that a film can command. Unable to produce the number and intricacy of settings called for in a script we often opt for a nearly bare stage that, with a change in lighting or a few props, can represent many locales or, at least, the general moods or themes of the play. Fortunately, the advances in lighting technology and control have made it possible for lighting to serve this expanded function as scene changer.

Multiple scenes and locales within a play are not new. Shakespeare and his contemporaries wrote beautiful plays with many changes of scene. Throughout the nineteenth century plays preceding the realist movement contained several varied locales. These conventions were contained within a cultural language very different from that which we use today. Shakespeare's audiences were accustomed to a theatre that employed little technology in creating a scene. Moreover they were educated to receive and integrate information through the medium of storytelling. The spoken word and written text were the communication channels of the day and therefore simple scenic devices such as a spoken description of the scene were sufficient and appropriate.

In the romantic period of the early nineteenth century, drawings, etchings and paintings were not only as artistic medium but were used as form of communication. Personalities and historic events were recorded in paint for posterity and for dissemination to a wider audience. Before the incorporation of the photograph, newspapers published drawings and etchings to describe everyday events. It is no surprise then that painted scenery became the preferred method of setting the stage. Romantic stories and the declamatory nature of the acting contributed to a melodramatic, presentational style of theatre. Painted scenery fits this style beautifully. Once again using the medium closely linked to the popular culture of the day could easily accommodate multiple scenes. In this case, a

1. Gibbons, F., "Computers 'Enhance' Shakespeare's Bottom", *The Guardian*, April 18, 2000, London, p. 11.

series of two-dimensional painted backdrops, wings and borders could easily be changed to create a change of scene.

Now we are at the threshold of being able to employ technology that will better realize the intentions of today's playwrights and better reflect the culture that has inspired the play. The visual language of our culture is to saturate the viewer with overlapping ideas through complex images and sounds. Typically these images are created with the help of computer and video technology. In fact, the creation of these images has become so ubiquitous that television, movies, the Internet and print media have reached a homogeneous aesthetic. All created with the same set of tools, the primary difference between these forms is mainly one of delivery. Incorporating these new digital media into live performance is only a matter of finding methods that will allow us to make it yet another delivery system for the new media. If television and movies are the media that have shaped the style of new playwrights, then why not employ the same storytelling tools that are used in those industries to bring their plays to life.

With CGI and other new media we can employ a stagecraft that will allow us to jump from place to place with the same ease evident in motion pictures. Similarly we can make jumps in time and create fantastic spaces that are not compatible with the physical laws of the universe. We can create fluid, ever changing environments that present settings for expressionist works in the same capricious manner in which thoughts are formed. This form of cinematic staging is exactly what many new playwrights had envisioned while writing their plays. During several experimental productions at the University of Kansas that employed new media as a scenic device, the playwright involved confirmed this. During discussions of the productions, playwrights maintained that in conceiving the work, they envisioned a totally separate, realistic setting for each scene, much as they might imagine a movie being filmed. They had not imagined their plays being produced in the nearly bare space typical of so many current productions. As further proof of the modern playwright's intent, a seemingly endless number of scripts are sent to us by playwrights who were dissatisfied with the traditional staging of their works. They have seen evidence of new media in performance and are eager to discuss the possibility of seeing their works brought to life in such a manner. Others send us works that have been dismissed as unproducible by producers at traditional theatres. In these cases the scripts call for more settings than can affordably be staged with traditional methods and requirements of the action do not allow them to be produced with the minimalist bare stage style.

Our most recent experiment in testing this digital media as a scenographic medium is *A Midsummer Night's Dream* at the University of Kent at Canterbury, England. Curiously, this production is an expression of my thesis done in reverse. Rather than using new technology to divorce a modern play from an inappropriate Elizabethan production style, we have rendered an Elizabethan piece in a modern style. Scenery was generated on backstage computers and projected onto onstage screens. The majority of the scenery was generated in real-time through the use of virtual reality technologies. Projecting the scenery in stereoscopic 3D and outfitting the audience with 3D-glasses created the illusion that the virtual settings shared the stage with the actors. Doing so created a bridge between the bidimensional, cinematic images of the scenery and the tridimensional presence of the live performance (figure 1).

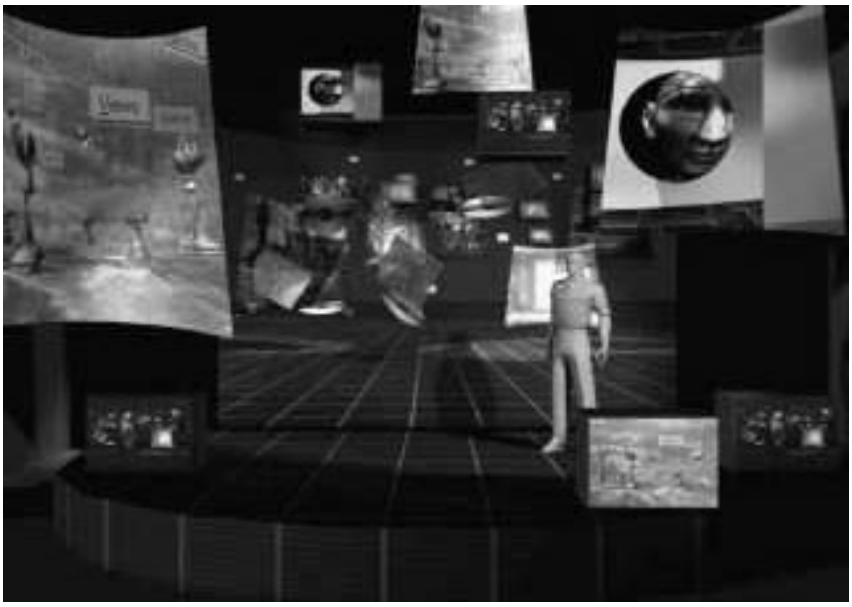

Figure 1. A computer-generated concept model of the production

One of the first steps in rendering Midsummer in a modern, cinematic style was to edit the script for length. Many of the edits were suggested by the 1999 Fox Films version of the play and the 1999 video adaptation by the Royal Shakespeare Company. Starting with a play that suggested multiple locales and using adaptations of film treatments left us with what appeared

to be a screenplay for the stage. We took the transformation one step further by breaking each of the many scenes played within the setting of the forest into distinctly different locales.

Figure 2. Act II, scene 1 : the chess-game "Royal court" of the fairies

Making each forest scene an individual setting was facilitated by the overall production concept. For this production it was decided that the fantasy world of the fairy forest would be updated to a modern fantasy realm of computer games, cyberspace and science-fiction. There were several reasons behind this choice.

First, as we were attempting to prove the value of using digital technologies to present a show to a modern, media-savvy audience, we thought it necessary to create the type of multi-layered, information rich, new media setting made possible with digital technologies.

Additionally, we were looking for a production esthetic that would compliment the computer-generated images that would be used to create the various scenes, thereby making the medium not just a conveyer of the concept but a part of that concept. By creating a computer-based world

inhabited and controlled by fairies, we sought to humorously illustrate the understanding many people have of the mysterious mechanical processes inside the computers that they use every day.

Finally, it was our intention to draw attention to the interesting manner in which people conceive of electronic communication and interaction mediums as a form of geography. In our production, we gave physical form to cyberspaces, replacing the more abstract notions of chat "rooms" and web "addresses".

Figure 3. Act II, scene 2 : Titania's bower. The fronds of the willow are comprised of words from the Midsummer *script.*

Dividing the cyber-forest into separate locales had the additional benefit of demonstrating the width and breadth of digital influence and, as a parallel, the vastness of our "cyber-fairy" world. The grove in which we first meet Oberon and Titania, the king and queen of the fairies, became in our production the scene of a computer chess game (figure 2). Titania's bower was constructed in a word processor motif, with words from the play text wafting as the fronds of an enormous willow tree (figure 3).

Figures 4 and 5. Act II, scene 2 : the "painted" forest. This scene was broken into several smaller scenes to give the production a more cinematic treatment.

Other settings included a maze through pages of the world wide web, a drippy paint program cave complete with wandering brushes and paint buckets (figures 4 and 5) a sewer strewn with the remnants of old *Pac-Man* and *Pong* games and an arena where the fighting lovers could battle in the midst of violent computer games. Act II, scene 2 (figures 4 and 5) was broken into several smaller scenes to give the production a more cinematic treatment.

Working with backward compatibility from the concept of the cyber-fairy world, those scenes of the play set in the mortal world were transformed in our production. The play was moved from the Athenian palace of Duke Oberon to the offices of a powerful computer company, Athens Corp (figure 6). Courtroom scenes were set in an office locale, the lovers plot their escape in the women's bathroom and the mechanicals plan their dramatic production on a window washer's scaffold high above the streets of the city.

Figure 6. Act I, scene 1: the "corporate" kingdom of Duke Oberon. The settings of the mortal world were rendered in muted gray tones to set them apart from the fairy world.

To illustrate the difference between the two worlds, the mortal world was created in gray shades and finished with photographic textures. In contrast, the "cyber-fairy" world appeared very colorful. Late in the play, when the

characters return to the mortal world, wiser and happier from their experiences amongst the fairies, the mortal world has been infused with color.

Judging the overall effectiveness of a theatrical production is always difficult. Assigning quantitative analysis to the various aspects of the production is largely subjective and subject to the prejudices of the artists. However, a few observations can be made. In this production we were able to stage 16 distinctly different scenes with 14 different virtual settings, changing from one to the next almost instantaneously. Editing the script and employing the fast moving, cinematic stagecraft gave the show a running time of 90 minutes. Once again, this running time is comparable to that of a feature motion picture and was intentionally targeted as a duration suitable to a modern audience. The audiences were excited about the experience and enjoyed the production, many reporting that they discovered new things in the story. Our observations of the audience bore this out, as it appeared that their attention never wavered.

The collaborators were immensely pleased with the production. Most of the objectives of the project were achieved. Our production of *Midsummer* was fast-paced and given a truly modern staging. Each action-packed scene was loaded with visual and auditory information. The modern conceit of the "cyber-fairy" world updated the play and provided a new telling of the story without compromising the language or the plot. The production served as just one of countless ways in which digital technology can be used by theatre artists to speak to a modern media-wise audience. Our last ambition for the show is that it may inform or inspire other artists to expand and improve our methods while creating their own new media-based productions.