

Concepts of Design for a Digital Stage

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**Figure 1: Student performers rehearse the opening scene of *The DuSable Project* at Northwestern University.
(Image courtesy of Kathryn Farley)**

Abstract. The emerging presence of computerized technologies in live performance has altered traditional approaches to theatrical design in a number of important ways. In this paper, the authors present a case study of *The DuSable Project*, a collaborative live theatre event, as a means of charting the development of effective set design strategies for a media-rich stage environment. The paper offers practical solutions to problems arising from an interactive and non-linear presentational format and is meant to be of value to artists, teachers and scholars alike.

1. Project Description, History and Goals

The DuSable Project tells the story of Jean Baptiste Pointe du Sable (1745? -1818), Chicago's first non-native settler. The play dramatizes episodes from DuSable's life, beginning with his departure from his birthplace to the sale of his Chicago homestead. The production celebrates the City's rich cultural heritage and is intended for young audiences (specifically seventh to ninth grade students-the age group that would be exposed to the subject of DuSable in history classes at school). The play was intended to expand upon classroom studies by bringing history lessons to life on stage.

Although DuSable remains a pivotal figure in Chicago's past, many details of his life have not been formally recorded. Historical speculation pertaining to his origins, family background and travels are numerous and varied. In fact, a definitive history of DuSable has yet to be written.

Legend holds he was an articulate, cultured, prosperous and diplomatic man, who effectively forged alliances between native and immigrant populations. He interacted with and became a member of many early Chicago communities, including groups containing Native-American, European and African peoples.

The DuSable Project presents the adventures of Chicago's first settler in classic improv comedy style. An ensemble of six actors assumes multiple roles in the story (such as DuSable, his wife Kittihawa, various family members and the friends and associates he meets along his travels). Live music (an important feature of improv) helps to define the mood of each scene. DuSable and his wife Kittihawa serve as the story's narrators and central characters; unlike the other roles, the same actors play these characters throughout the story.

In drawing on comedic improvisational forms, *The DuSable Project* approaches the subject of Chicago's origins in a humorous, forthright and revealing manner, allowing the story to be accessible to young audiences, yet containing more sophisticated references for all ages. The comedy techniques employed in the production represent an art form indigenous to Chicago (the improv tradition was born in the City and perfected by members of such pioneering theatre companies as The Compass, Second City and ImprovOlympic). In terms of its significance as a theatrical genre, improvisational comedy is notable for promoting a high level of audience/performer responsiveness.

By incorporating non-linear storytelling techniques and interactive imagery the play seeks to tell DuSable's story in a multi-layered fashion: by weaving together the many scholarly accounts of his life into the skeletal bones of a historical record that is incomplete at best. By introducing multiple perspectives on past events, and attempting to bridge the gaps in the recordation of his life, the intention is to introduce the audience (composed mostly of students) to history's complexity and nuance. In addition, each performance presents a unique opportunity for audience members to personalize the past, by making pieces of DuSable's story their own.

The text of play is based on *DuSable*, a script devised and developed by Zellner in collaboration with Red Path Theater (Illinois' only Native American theatre company). Readings of the play have taken place at the Chicago Historical Society, Truman College, and as part of the first annual Juneteenth Festival of African-American theatre at the University of Louisville.

The work was subsequently adjusted from traditional proscenium presentation to include 3-D technologies with the assistance of members of University of Illinois' Electronic Visualization Laboratory. This version imagined the story in a virtual reality landscape. Due to cost and scheduling restrictions, though, only a few scenes of the play could be realized using a 3-D format. Such a platform required a lengthy and arduous pre-production period,

involving storyboard, modeling and graphic design phases of completion. Ultimately, such an endeavor proved to be too labor intensive and expensive to pursue further.

In late spring of 2003 a multidisciplinary group of theatre artists composed of students, staff and faculty members received a grant of \$10,333.00 from Northwestern University's Center for Interdisciplinary Research in the Arts to reconfigure the play to a more mobile, adaptable and cost efficient model of production-one better suited for campus use. The Project brought together practitioners from the disciplines of Theatre (the co-author of this paper, as well as Professor Sandra Richards from Northwestern and Professor David Saltz of the University of Georgia), Performance Studies (co-author), and Digital Media (Dan Zellner of Northwestern University Library and independent playwright) to actively experiment with concepts of design for a digital stage, and to coalesce individual approaches to the creation of digital art works for a live audience.

Most important, though, *The DuSable Project* provided Northwestern undergraduate and graduate students the unique opportunity to conceive, design and present an original multimedia work of historical content, and to receive hands-on training in improvisational comedy techniques and digital media design in the process.

When the collaborative group met in the fall of 2003, we decided to immediately make contact with the various Chicago cultural groups working to preserve DuSable's legacy, in order to invite them to participate in the creation of a new version of the play's text. These groups included: Friends of DuSable and The DuSable League, as well as members of the Haitian, Catholic and Native American communities. We met with representatives from these organizations throughout the autumn in to discuss the script and review details concerning the numerous historical and scholarly accounts of DuSable's life. Zellner (the playwright) began to revise the text, based largely upon feedback obtained from the cultural groups.

Originally we intended to perform the completed play during the month of February 2004 in conjunction with Black History Month celebrations on Northwestern's campus. However, given our commitment to working with the cultural groups to revise the script, such a plan was not feasible. We decided, instead, to present a staged reading of one scene (that had undergone extensive modification) to members of the university community in the spring. Working on the scene would enable Zellner to experience the text in performance- a crucial step in the play's developmental process.

On April 28, 2004 we hosted **The DuSable Project Community Colloquium** in the Clarence L. Ver Steeg Faculty Lounge of the University Library. The night's events consisted of the presentation of one scene from the play, followed by a roundtable exchange of ideas led by the collaborative team members and cultural group participants. The audience consisted of scholars, artists, teachers, community activists, students of all ages and City of Chicago representatives.

To realize the scene, we assembled a group of four student performers (three undergraduates and one graduate student) to begin working on the text in late March, allowing one month of rehearsal time before the presentation. The performers possessed varying levels of acting

experience and represented departments as diverse as Radio/Television/Film, Performance Studies and Mechanical Engineering.

2. Digital Stage Configuration: The Challenge of Physical Placement

The stage design for *The DuSable Project*, like any theatrical production, is predicated on the demands imposed by a specific physical location. The challenge for a set designer working within a digital stage environment is to utilize the given space to accommodate technological instrumentation, while simultaneously providing the performers and director with the largest possible playing area. Also, equipment must be placed near enough to the projection surfaces to be effective and in close enough range of the technical personnel in order to be manageable. Meaning, technology must be placed unobtrusively yet accessibly throughout the stage area, in order to ensure freedom of movement, on one hand and ease of operation on the other.

Besides dealing with issues of equipment placement, *The Dusable Project* collaborative team confronted two major obstacles relating to the set: mobility and cost. First, because the show was designed to be performed in various campus venues, it was mandatory that the set be mobile and easily transportable. Second, set-related costs could not exceed the \$1,500 allotment in the budget. To answer both requirements, we decided to use a pre-configured, portable stage apparatus, as devised by Zellner and members of his theatre company Studio Z theatre company in consultation with members of The University of Illinois-Chicago's Electronic Visualization Laboratory. This platform included the following equipment:

- Three InFocus LP350 DLP projectors
- Disney Rear Projection screen outfitted for theatre use
- PC configured for digital theatre (dockable hard drive and dual head video card installed)
- AV/Projector cart with configurable mirror to cut projector throw distance
- Boss JS-5 JamStation sequencer
- Fender P-250 portable audio system with speaker stands
- Multimedia Presentation Software (Arkaos and Scala Programs)
- Digital scenery/object gallery

Studio Z's stage apparatus required two people approximately forty-five minutes to assemble and could be easily broken down for transport into a van or other large vehicle. The platform's ease of assembly and delivery would permit us to travel from one location to another quickly and efficiently.

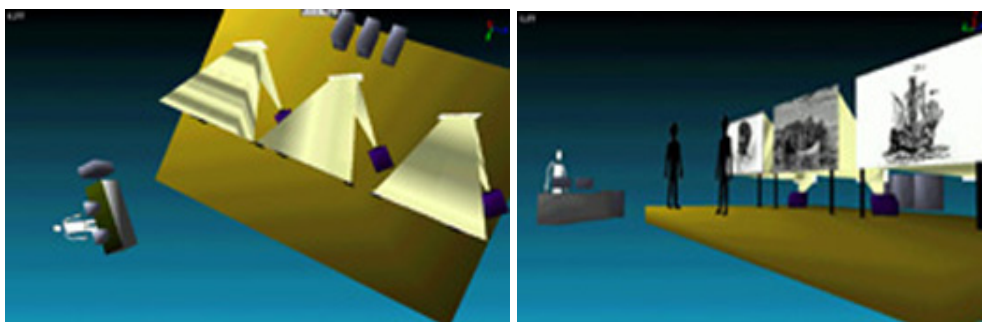
For the purposes of the staged reading, though, mobility became less of a concern. The library space could be easily transformed into a stage environment, with the added benefits of being able to accommodate an intimate audience of approximately forty spectators and having a central campus location. In many ways the room functioned as a black-box theatre or malleable performance space, in which the location could be adapted to the specific requirements of our production.



Figures 2 and 3: Set design illustration and equipment placement in stage space.
(Images courtesy of Sam Ball)

Figure 2 shows the stage configuration of *The DuSable Project*. In the design, an object defines the playing area (in this case an oval, lightly-colored piece of carpeting). Two video projectors mounted to the left and right-hand stage walls light the actors from above (as depicted in Figure 3). A large rear-projection screen (with video projector in back) occupies the center-stage position. In addition to providing necessary lighting, these three projectors also display computer-generated imagery simultaneously onto the floor of playing area and the center-stage screen, and, in some instances, directly onto the players' costuming, depending on their movements on stage.

For the reading, the set design had to be adjusted slightly to accommodate the University Library space. For example, a piece of carpeting was not required to define the playing area as the Ver Steeg Lounge contained light-colored flooring. Thus, imagery could be projected onto the existing carpeting with no difficulty. In this setting, we opted to place the two computer operators who ran the show just outside the playing area, very close by the actors on stage. These operators (situated in the far-downstage right area of the platform, as depicted in Figures 4 and 5 below), sat at small tables containing audio, lighting and computer equipment to manipulate the graphic imagery, lights and sound during the performance. A live guitarist playing Blues (another Chicago-based artistic tradition) was positioned on the other side of the stage, directly across from the two computer operators.



Figures 4 and 5: Digital stage configuration with computer operator just outside the playing area on stage. Unlike this model, however, our project utilized a single rear-projection screen set-up with two wall-mounted video projectors.

(Images courtesy of Kathryn Farley)

This arrangement of equipment and personnel achieved the desired goal of allowing the actors to move unencumbered throughout the playing area and behind the screen. Also, equipment was easily accessible to the technical personnel running the show. More important, though, this configuration served to integrate the technical and artistic aspects of the production within a single visual framework. The performers, computer operators and musician (the complete cast of live players) balanced the stage picture evenly, providing a visual reminder of their symmetrical (equally significant) artistic contributions.

3. Non-Linear and Participatory Dimensions of the Narrative

Thematically, *The DuSable Project* encourages audience members to recognize historical accounts for what they are: namely, human explanations (complete with inaccuracies and imperfections) of recorded actions that shape our understandings of the world. By performing pivotal events in the history of Chicago and DuSable's own life, the work attempts to bridge absences in the "official" recordation of the City's founding. In addition, by dramatizing multiple accounts of DuSable's life young audience members are challenged to make up their own mind about who he was, and, in doing so, to actively question the validity of historical methods in presenting "truths" about the past.

The text of *The DuSable Project* is composed in such a way as to help audience members understand how to challenge historical authority. The story contains a branched structure, meaning there are numerous directions in which the plotline can travel. During performance, the audience assumes the position of pilot of the text, having the ability to select and navigate through various plot options to advance the story forward. These options correspond to absences in the "official" recordation of DuSable's life and the founding of Chicago-events that historians have attempted to explain and contextualize. Often, though, these accounts are contradictory. In the play, Zellner has opened-up scholarly speculation concerning DuSable's origins, motivations and character traits for audience consideration. By presenting the moments of DuSable's life that have been the subject of historical study as narrative options in the text, the script cleverly allows for the articulation and examination of many contradictory theories.

The play's storyline is configured according to audience suggestion the live performance- the defining characteristic of improv comedy. The scene dramatized for the **Colloquium**, for instance, focused on DuSable's background and route to Chicago. In this sequence, the text offers the audience the ability to choose between three explanations of his birthplace and journey to the Midwest region. Historical explanations pertaining to Haiti, Canada or Southern U.S. influences on his life are provided for selection. The play's narrators offer these options to the audience, along with various artifacts and documents provided by the historians. Meaning, options are contextualized with historical evidence (illustrated visually on stage via the projected imagery which is detailed in the next part of this paper).

The final selection of a plotline option, in keeping with the democratic nature of improv comedy, is determined by a majority vote (either by hand or vocally). It is important to note, however, that after a selection had been dramatized, the story returned to a central point in

the text so that information arising from the options not selected could be conveyed to the group.

4. Developing a Unified Aesthetic: The Challenge of Technological and Narrative Coherence

To carry out the goal of empowering audiences to question historical methods and influences, themes relating to “playing with time” and “combining the old with the new” form the basis of the production’s unifying aesthetic framework: a collage of images that can be added to, subtracted from or reassembled during a scene or sequence of scenes. These collages would mix historical materials (maps, charts, illustrations, snippets from historical texts and other scholarly papers) together with digital photographs, video, and computerized renderings of locations and physical settings. The aim of designing such a multifaceted collage motif was to create an immersive, tactile and multilayered stage environment—one that complicated, rather than complimented what was happening on stage.

In keeping with the play’s thematic content, collages visually emphasize the complexity of history and the overlapping nature of memory. The mixing, blending and entwining of collage imagery mirror the complex processes required to not only to recall past events, but through the act of performance, to relive them anew on stage. Similar to the story making methods presented, collages are multi-voiced and aesthetically autonomous. Comprised of numerous sources, styles and types of visual data, collages uphold a collective and multicentered points of view (as opposed to a historical text which is dominated by a single voice or perspective). Further, the fluctuation of movement from one collage to another reinforces the notion that history is an evolving course of action, rather than a linear chain of events.

As conceived, each collage would be infinitely rearrangeable. During the show, imagery is accessible via a midi-keyboard. On the board, each separate image occupies its own key. The order of appearance of any image, however, would not be predetermined. Rather, the computer operator would possess the ability to select and compile images for a specific collage spontaneously in live performance. Thus, every collage will be unique and impossible to replicate. Like the performance event itself, collages would take on the persona of living, evolving being, rather than a static collection of objects.

For example, the opening collage (depicted in part in Figure 6 below), if spontaneously delivered, would depict both the forward and backward progression of time simultaneously. Within the same visual canvas a patchwork of imagery interweaves artifacts from the past with present-day cultural reference points and orders them randomly (giving them equal weight). Such a random arrangement of visual information permits audience members to recognize how vestiges of the past manifest themselves in present day life. Such a flexible presentational format gives rise to a form of historical analysis that is more accessible, familiar and immediate to young people.



**Figure 6: Opening sequence collage: present-day Chicago.
(Image courtesy of Sam Ball)**

In practice, however, such flexibility was not possible. First, two operators were required to run the show for the reading, not one. The first operator controlled the images from the two wall-mounted side projectors onto the playing area surface, the other managing the flow imagery onto the center screen. To require these two separate operators (one a collaborative team member and the other a technically-skilled undergraduate student), not to mention their individual computers, to act as one, would have been impossible. An uncoordinated (unsynchronized) effort on their part of the operators would have been obvious to the audience, as images would have appeared in a scattered fashion on the projection surfaces, possibly disorienting the actors. Second, the imagery was constantly being adjusted to modify artistic and dramaturgical content, to better adjust to actor's movements on stage and to maximize the theatrical potential of the space. The computer operators did not have enough time to familiarize themselves with the finalized imagery, nor was the imagery itself in a state of preparedness to allow for spontaneous retrieval. For the purposes of the reading, the show's imagery was pre-made and pre-ordered.

The pre-configured ordering of the images, though, did not detract from their visual appeal and dramatic impact. Aesthetically, multiple layers of images added texture to a given scene. Further, the action of constructing, deconstructing and reassembling collages built momentum for a succession of events, while focusing attention on a specific image or moment in time.



Figure 7: Collage introducing DuSable: various depictions of his person and homestead with contemporary Chicago in the background. (Image courtesy of Sam Ball)

Figure 7 illustrates various interpretations of what DuSable may have looked like. This collage has, as its backdrop, scenes from contemporary Chicago life—again forging a connection between the past and the present in one visual landscape. In this moment of the play the main character appears on stage for the first time. The collage, though, instead of placing DuSable in a fixed location or period of time, introduces the idea that he is viewed differently by different people, and, subsequently there are numerous ways to describe and understand him. No single explanation is better (or more legitimate) than another. Further, although his story is relevant to all time periods, he is also distinctly human; his corporeality represented on stage by the live actor who may or may not resemble one of the three illustrations offered regarding his physicality.

Figures 6 and 7 points to the ways in which the projected imagery in this production moved beyond the traditional functions of scenography. Instead of merely providing a backdrop for performers' activities, the projected visual text of *The DuSable Project* played an integral role in maintaining the interactive character of the stage environment by encouraging audience members to make up their own minds regarding the validity of the historical material presented.

5. The Challenge of Usage



Figure 8: Interactive imagery: Northwestern performers rehearsing for the staged reading. (Photo courtesy of Kathryn Farley)

In theory, the stage apparatus, narrative devices and projected imagery would work cooperatively to empower the audience to act in a participatory capacity. In practice, however, some of the production's interactive features operated more effectively than others.

The portable stage platform attempted to optimize the participatory nature of the storytelling form by establishing a user-friendly setting. In performance, though, the apparatus worked less efficiently than expected. Specifically, a few pieces of technical equipment malfunctioned for part of the show (as can be expected in live situations). For example, during the opening sequence (the collage of Chicago's past and present) one computer lagged a few seconds behind the other machine, leading to a jagged presentation of images. Mysteriously, the computer corrected itself a few minutes into the show, and the imagery was synchronized thereafter. The glitch reinforced the need to establish a well-conceived back-up plan that could address technical breakdowns when (not if) they occurred; a detail we had considered but not sufficiently developed for implementation in a real-world setting.

The unique storytelling strategies employed in the work (described in section three of this paper) were intended to promote heightened levels of performer-audience responsiveness. By selecting various narrative options, audience members would help to determine the path of DuSable's journey and, in so doing they would become full-fledged collaborators in real-time story making processes.

In the staged reading, the narrative selections were greeted with a wide range of reactions from the audience, everything from awe to indifference. The student performers were prepared for many responses, yet they appeared to be quite frazzled by audience members who were unwilling to voice any preference relating to options for the plot. In short, they were not prepared for an uncertain response, or no response at all. After the event, one of the collaborative team members remarked that a lengthier rehearsal period would have allowed

the actors to become more comfortable with the operational format so as to react more spontaneously to audience suggestion (or lack thereof). Working within a multimedia environment is tough enough on trained improv actors; neophyte performers require additional time to adjust not only to the equipment but also to each other and the presence of live audience members. We learned from this experience that an interactive media-intensive format necessitates a great deal of rehearsal time with actors.

The selection of this particular scene from the play might have also contributed to the actors' feelings of unease. The scene dramatized in the reading set up the semiotic codes of the performance, laying down the foundation for the ways in which the audience were asked to participate in the play. In this scene a plotline option is presented for the first time to be considered by the audience. Separating the events of the scene from the larger context of the story might have confused audience members about what the production (specifically the text and actors) were requiring them to do. Clearly, the audience's bewilderment caused the actors to become anxious (and to project their own discomfort back onto the audience). The truly reciprocal exchange of energies communicated between the audience and performers during the staged reading suggest that a heightened level of interactivity was achieved. On the other hand, though, it also reveals the fact that the collaborative team had proceeded with faulty, or at the very least naïve assumptions regarding a theatre audience's enthusiasm for and engagement with interactive formats. Were audience members unwilling to participate in the ways in which we had prescribed or was the interactive format itself a cause of anxiety? Future productions of the completed play will help to determine the answer. These will take place once the script has been finalized.

While exhibiting apathy towards the narrative options presented, the audience was much more emotionally engaged with the projected imagery. Younger spectators, particularly, greeted each collage with enthusiastic audible responses. Many audience members approached collaborative team participants after the reading to relay their favorable impressions of the imagery. Adults remarked on the complex and nuanced dimensions of the projected text. They thanked us for encouraging them work hard at making meaning of each collage. Young viewers commented the images were "cool" and "fun". One university student stated that the imagery reminded him of playing a video game, except that in the play the imagery felt more immediate and immersive. Thus, the projected text successfully fulfilled the goal of helping to create a visceral and aesthetically engaging stage environment for the audience to experience.

6. Conclusion

The DuSable Project represents an integrated approach to digital stage design—one that effectively weighed the needs of the live participants and the demands of technology against the physical limitations of a given location. The project's set design is notable for its constructive allocation of space, its dynamic aesthetic framework and its ability to carry out some of the work's interactive objectives. The design also promotes innovative approaches to using a single technology for multiple purposes (a video projector, for example, functioning as a lighting source and projection instrument), and adopting pre-configured stage apparatuses for the purposes of producing multimedia theatre works in university settings (where cost, flexibility and mobility are primary considerations).

When implemented in real-time performance, some set design initiatives intended to increase performer/audience responsiveness worked better than others. Most important, though, because of the staged reading the collaborative team is now in a much better position to alter the play in order to more effectively encourage the audience to interrogate historical methods of study. Is there room for improvement on this point? Yes, absolutely. We should begin by considering how to help frame the plotline options differently. This is not just an issue relating to the text, as any procedural adjustment will impact how the piece is staged.

In presenting an overview of the scene design of *The DuSable Project* the authors' aim is to draw attention to some of the options available to meet challenges arising from working with digital technologies in live performance. In our enthusiasm to document our findings and share our insights, though, we do not mean to gloss over the difficulties inherent in working within a media-rich theatrical environment: the need to labor intensely, concentrate intently, maintain a cooperative and patient attitude and, most significantly, to embrace experimental methods of practice. Technological integration also requires teamwork, shared responsibility and collaborative decision-making processes. In short, participants must work efficiently on both individual and collective levels.

The upside of such effort is the potential of discovering new ways to configure a theatrical environment, the ability to experiment with alternative storytelling strategies on stage and the possibility of engaging audience members with the tools of twenty-first-century life. To this end, it is our hope that this paper will contribute to scholarship concerning the integration of digital media into live theatre that is comprehensible, useful and realizable. Ultimately, the set design described in this work may help to create a new vision of what practitioners can accomplish with interactive media technologies in theatre production.

References

Following is a list of Web sites for projects/organizations referred to in the paper:

Information and production photos from *The DuSable Project* can be found at: <http://www.kathrynfarley.org> (under the heading "Artistic Work")

Electronic Visualization Lab, University of Illinois-Chicago: <http://www.evl.uic.edu>

Northwestern University Center for Interdisciplinary Research in the Arts: <http://www.northwestern.edu/cira>

Studio Z Theatre Company: <http://www.studioz.org>

About the Authors



Sam Ball (Lead Designer of *The DuSable Project*) is an emeritus professor of Theatre at Northwestern University where he devised and implemented the curriculum in design

and technical theater. He has been a moving force in theatrical performance since 1960. His design credits include more than one hundred productions, ranging from *One Foot in America* at Northwestern to *Before My Eyes* at Chicago's Victory Gardens Theater. Other credits include the Lyric Opera, Chicago, local television stations WMAQ, WLS, and WGN, the Seattle Repertory Theater, and the Orlando Shakespeare Festival. He recently completed a two-year stint as the theater consultant for the Northwestern Settlement House Vittum Theater, Chicago.



Kathryn Farley (Stage Director of *The DuSable Project*) is a doctoral candidate in the Department of Performance Studies at Northwestern. At Northwestern Kathryn has taught undergraduate courses which explored the performance of contemporary drama and the adaptation of fiction. Her most recent class, "Multimedia Improvisation" blended improv training with hands-on exposure to digital media design and application. A portfolio of Kathryn's artistic and academic work can be

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The authors wish to thank the three anonymous reviewers of *Crossings: The Electronic Journal of Art and Technology* who carefully scrutinized this paper. They offered valuable suggestions intended to improve its original content.

NOTE: This paper is scheduled to be included in issue 4.1 (2004) of *Crossings: The Electronic Journal of Art and Technology*, a peer-reviewed multidisciplinary academic journal that aims to explore the areas where technology and art intersect. This issue will appear in the next few weeks. The journal, published by Trinity College, University of Dublin, is located at <<http://crossings.tcd.ie>>.

The paper is written for a general audience of scholars/artists who may be unfamiliar with the intricacies of theatre practice.