Abstract

From 2002 - 2003 the author was in Paris documenting the production of Philippe Manoury's electronic opera K... The opera combines real-time electronics with full orchestra and singers. A tripartite DVD-Rom was created to document the production of the opera and analyze the results. Through interactions with video, audio, analyses, interviews, and research articles, users are allowed an indepth view of the opera. Interaction design issues were considered in creating this multimedia hyper-document. The DVD-Rom was constructed for three archetypical users: the non-technical opera goer, the technically and musically oriented composer or programmer, and the producer. Each projected user was defined by goals, skill level and experience. A timeline of 18 months was outlined, giving the project its practical and conceptual limits.

1 Introduction

From 1998 to 2000, French composer Philippe Manoury created K..., a large-scale opera integrating electronic and acoustic elements. The opera, after Franz Kafka's The Trial, premiered in 2001 at the Opera-Bastille, and was restaged in 2003. Manoury conceived and composed the technological elements of the opera in tandem with the acoustic components at Ircam. Fourteen singers, a full orchestra, a children's chorus, and 2000 real-time electronic events make up the 1 hour and 40 minute dramatic musical presentation.

At Ircam during the months before and after the restaging of the opera in 2003, a DVD-Rom was designed and created by the author. The multimedia electronic document was designed to be a repository for information about this significant opera. The research included the investigation of digital techniques for the generation and control of sound, acoustics and aesthetic theories governing the spatialization of sonic events, interviews with participants, and the systematic documentation of all procedures used.

The DVD-Rom entitled "From Kafka to K..." is divided into three sections, 'Components,' 'Context,' and 'Construction.' Interaction design guided the structuring and content for each section. The three user profiles that emerged, dictated the form and constituents of the DVD-Rom, as the needs and skills of each user were considered.

The prototype was designed and constructed at Ircam in July of 2003. Refinements continued over the next year. The project included text, score, audio, image, and video materials. Using mpeg2 compression, 176 excerpts comprising 25 hours of video footage were included in the project.

2 Why Document K...?

Electronic opera can be considered a recent offshoot of traditional opera that has not been well studied or documented. In the past 50 years, only about twenty electronic operas have been produced in the world. The cost of mounting new operas is very high. The challenges encompass the coordination of large sets, elaborate costumes, a large ensemble, a full orchestra, choreography, music, movement and drama. When live electronics are added, the difficulties become almost insurmountable. Manoury is one of the first to do this on such a grand scale, with K... being his second electronic opera. The 2003 restaging of K... provided a significant opportunity to document its production process.

2.1 The Use and Impact of Technology on K...

The use of technology in K... has a significant impact on the experience of the opera. Electronics can delineate formal sections and are sonic markers at turning points in the opera. The technologies in K... can be grouped into four general categories: synthesis, sampling, transformation, and spatialization.

Samples were used to amplify events, simulate events, for symbolic meaning, and to create a virtual orchestra. To create a virtual orchestra, Manoury samples orchestral instruments and deploys them as spatial, temporal, or timbral counterpoint to the acoustic instruments. Spatialization in K... introduces an immersive tactile dimension, simulates unusual virtual sites, and 'conditions' the architectural space. One of Manoury's aims was to create changing virtual expanses through the modification of distance cues embedded in the electronic tones. Movement through a cathedral is simulated by altering the amount of early reflection reverb in a sonic event (sound that returns to
the listener by bouncing off virtual, nearby walls) and adjusting its spectral content (higher pitches are attenuated with distance).

Psola (pitch synchronous overlap-add) is a synthesis technique used in K…. Psola is a process that enables transposition or time-stretching of a sound sample, independent of pitch, speed, and timbre. In K… psola is used to create a virtual choir and to submit the choral sounds to transformations not possible with live singers. The virtual choir is generated from 200 samples of chorus members singing 10 excerpts of Czech poetry.

3 The DVD-Rom Design

The initial goal for the DVD-Rom was to accumulate information about K… and organise the information into linked modules within an 18 month work schedule. Using multiple representations of content (audio, video, text, score, and patches), five approaches were initially postulated: General, Analysis, Technological, Production, and Composite. Later the project was reorganised into three sections - Documentation, Analysis, and Experimentation.

3.1 Scaling Down Goals

In the initial design, the ability for user self-organization was central to the DVD-Rom. With an 18 month timeframe, it was clear that user self-organization was a unworkable objective, so it was discarded.

Three potential users were targeted and the final organization structure was outlined. Three sections corresponding to each user were Components, Context, and Construction.

4 The User Archetypes

For each user, a profile was created. The 'Construction' section user is an opera goer. He loves music, buys the opera program, wants to know about the plot, history, characters, singers, and how the opera was constructed. He is a non-musician, non-technician, with a computer skill level of beginning to intermediate.

A composer with technical interests (or a programmer with musical interests) is the end user of the 'Context' section. She is interested in details about the technology, wants to experiment with the technology, wants to understand how the music works, and can read music. Her computer skill level is continuing intermediate to advanced.

The third user is a producer of opera or theater. He wants specific information about how the opera was rehearsed, staged, and the electronic elements integrated. His computer skill level is beginner to intermediate.

5 Content

The three major sections of the DVD-Rom are each divided into three subsections. See Figure 1. for a complete list of sections and subsections.

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<th>III. Construction</th>
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<td>A. Technology</td>
<td>A. Composition</td>
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<td>B. Characters</td>
<td>B. Music</td>
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<td>C. Synopsis</td>
<td>C. Analysis</td>
<td>C. Rehearsal</td>
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Figure 1. Section and Subsections in the DVD-Rom

5.1 Components

The three subsections of the 'Components' section contain text, video, image, score and audio. The 150 video clips were filmed at the Opéra Bastille during rehearsals in 2003. Audio excerpts were extracted from the 2001 production. The Virtual tour of the opera is a user navigable collage of 200 images from dress rehearsals (all photos and text by the author). See Figure 2. for a list of contents in the General Information subsection.

<table>
<thead>
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<th>I. Components</th>
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<tr>
<td>A. General Information</td>
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<tr>
<td>k. Cast and Production Personnel</td>
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<td>l. Doubling of characters</td>
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<td>m. Story Elements of the opera</td>
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Figure 2. Contents of General Information subsection

The second and third parts of the Components section concern the Characters and Synopsis. In these two sections each character in the opera and scene are individually described with illustrating video clips.
5.2 Context

Technical and theoretical explanations for each of the technologies used in the opera are given in the first part of the 'Context' section. This subsection delineates how the technology was used in the opera and provides example patches enabling users to record real-time sonic manipulations of samples and examples from the opera. An indepth article on the real-time performance system used the Opéra Bastille is presented in this subsection.

Compositional details and a musical analysis of the opera are presented in the Music and Analysis subsections. The analysis includes an examination of structure, pivot points, recurrent elements, and how technology impacts the opera. In all parts of the Context section, score examples are synchronized with audio files.

5.3 Construction

The Construction section comprises Composition, Production, and Rehearsals. The Composition subsection examines Manoury's use of Open Music to generate musical materials. To illustrate Manoury's musical processes, this subsection traces the changes from his sketchbooks to the final score. See Figure 3. for a list of the topics in the composition section.

a. Open Music and the Generation of Musical Materials
b. Composer sketchbooks
c. Czech poems and the virtual choir

Figure 3. Topics in the Composition subsection

In the Production subsection, interviews with the composer, director, conductor, set designer, production personnel, and singers can be viewed. See Figure 4. for a complete list of interviewees.

a. Composer - Philippe Manoury
b. Conductor - Dennis Russell Davies
c. Director - André Engel
d. Set design - Nicky Rieti
e. Musical Assistant- Serge Lemouton
f. Regie de Scene - Monica Waitzfelder
g. Props - Claire Davignon
h. Josef K... - Andreas Scheibner
i. Leni/ Bailiff’s wife - Jeanne-Michèlle Charbonnet
j. Judge/Priest - Gregory Reinhart
k. Titorelli - Kenneth Riegel
l. Franz and Willem - Ian Thompson and Wilfried Gahmlich
m. Information Officer/Understudy for Josef K... - Sergei Stilmachenko
n. Bailiff/Block - Wolfgang Ablingier-Sperrhacke
o. Inspector/Flogger - Yuri Kissen

Figure 4. Interviewees in Production subsection

In the final subsection of the Construction section, rehearsals are documented and described. This section includes journal entries made by the author during the three weeks of rehearsals at the Opéra Bastille. Video clips of how the director and conductor worked with cast members are also found in this area.

6 Problems

The administration of the Opéra Bastille initially refused to give permission to film rehearsals. The author attended the first week of rehearsals, getting to know the staff and cast, assisting with the set up and execution of technology, and writing journal entries. Finally, the composer intervened at the end of the week and permission was secured. The cast and crew were also asked directly for permission before filming began.

The opera is unique in its melding of 16 channels of spatialized audio with orchestra and singers. After much negotiation, Opéra Bastille administrators agreed to allow Ircam to create a multitrack recording of K....

It was hoped that a professional crew would film a performance of the opera with multiple cameras. The edited result would have been merged with a multitrack recording of the same performance. Thus, a visual and multichannel experience of the opera could have been preserved. The cost of securing video rights from the singers and orchestra was estimated at 300,000 euros. As no financial backing was found in time, this proved prohibitive.

5 An Example from the DVD-Rom

The following is an excerpt from the DVD-Rom, found in the Context section, Music subsection. Throughout the DVD-Rom project there are approximately 110 score examples synchronized with audio.

7.1 Blackouts in the Opera

There are four marked blackouts in the score, although only three are actually performed. Blackouts are moments in the opera when the action stops and fast moving electronic sounds, are heard moving with dramatic trajectories around the opera hall. The Blackouts occur in Scenes III, VII, and XII. Manoury hopes that the spatial trajectories are more notable than the nature of the sounds themselves.

The first Blackout occurs in Scene III just after Josef K... has finished a telephone call informing him of required Court interrogations. He is disturbed by the call. Upon his hanging up the phone, the action stops, the sound of the virtual choir is heard moving quickly through the opera house. K... looks up and sees an external manifestation of
his own sense of guilt and desire for death. Two men are looking at him intently, displaying a large gleaming knife. The moment passes, and the men disappear. K... is shaken, but work continues in the bank. See Figure 5 for Manoury's handwritten full score of the first Blackout.

Figure 5. Blackout I in Scene III of K...

6 Conclusions

The project was conducted over two years and two continents. In multiple formats, the DVD-Rom illustrates and analyzes the musical components, technical elements, and the experiences of those involved. The resultant document is one of the first DVD-Roms to analyze a contemporary opera. As contemporary operas are often not accessible due to performance expenses, this document is a step towards preserving at least a part of the artistic experience. This exploration brings new dimensions to artistic practices involving technology, and provide insights into the emergent artform of contemporary electronic opera.

7 Acknowledgments

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References


