HINDSIGHT:
AN ELECTRO-ACOUSTIC COMPOSITION
FOR 5.1 SURROUND SOUND

A THREE-HOUR CREATIVE PROJECT

SUBMITTED TO THE GRADUATE SCHOOL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE

MASTER OF MUSIC IN COMPOSITION

BY

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Introduction

Hindsight is an electro-acoustic composition for 5.1 surround sound. It is a three-credit-hour creative project completed during the summer semester of 2005 at Ball State University. I wanted to compose a new piece of music that was a collection of ideas gathered during my studies at Ball State University. Looking back, I choose elements or events that I could understand or judge from this point in time: percussion; a trip to Chidumbram, India and Middle Eastern musical aesthetics; and electro-acoustic music, both art and popular. *Hindsight* fuses these different elements into an electro-acoustic composition. This paper will discuss the importance of the elements and events used in *Hindsight*. First, there is a discussion and descriptions of this creative project. Secondly, there is a discussion about why percussion was chosen and what instruments are used in this composition. Next, I discuss the elements inspired by a trip to India, Middle Eastern aesthetics, and how they are apparent in the music. Lastly there is a short history of electro-acoustic music, and a discussion of my choice to incorporate techniques from both the art and popular genres heard currently.

Discussion and Description

This composition, as mentioned above, is for 5.1 Surround Sound. This choice is a direct result of the recent popularity of this format and its widespread availability. This accessibility allows for a wider array of listeners and not just audio professionals. The first step of completing this project was recording the sounds intended to be used in the piece. I performed and recorded all of the samples heard in the piece. The recordings were made primarily at my home recording studio and Ball State University's Music Technology Studios. Each recording was made with multiple microphones: Blue Dragonfly, Blue Blueberry, Neumann M147, Royer R-121, AKG Solidtube, Sennheiser MKH40, and an Audio-Technica Pro37R. Each microphone had a distinctive character which gave a larger amount of compositional options.

Once the recording process was completed the samples were cut to the desirable length. The next step was to take these samples and create multiple manipulations of each of them. This process was done using Peak, a stereo digital audio editor, and also done on a Korg Triton synthesizer.[1] The types of processes done to the files include pitch shifting, convolution, normalization, time stretching, granular synthesis, and many different effects produced with Pluggo, a collection of VST plug-ins produced by the company Cycling '74.[2] This step produced approximately five-hundred variations of the original recorded material.

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[1]Peak (Version 4) [Computer software]. Petaluma, CA: BIAS, Inc.

[2]Pluggo (Version 3) [Computer software]. San Francisco, CA: Cycling '74.

All of these samples were then imported and assembled with Digital Performer 4 on a G5 dual-processor Macintosh Computer with 2 gigabytes of RAM.[3] Kontakt, a software sampler, was also used within Digital Performer to create three instruments: a microtonal berimbau, a second microtonal berimbau, and a snare drum.[4] I performed and recorded all of the samples used to create these instruments.

Hindsight is exactly 10 minutes and 41 seconds long and consists of several sections: an introduction, a section featuring the microtonal berimbau, a section featuring the snare drum and industrial drum beats, a section featuring the ocean and brushes on a snare drum, an ambient section, and a concluding section featuring most of the elements heard previously along with hip-hop drum beats and Middle Eastern percussion. The method used to assemble these sounds was based on grouping similar ones together, trying to group them in a way that implied the organization typical of electro-acoustic art music and popular music, and lastly trying to maintain an aesthetic suitable for various types of listeners while still realizing that not everyone will find pleasure in listening to the piece. The following sections will discuss the different elements used in the piece in greater detail.

Percussion

Percussion has always been an important part of my musical development. I began playing piano at an early age, then studied orchestral percussion, marching

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[3]Digital Performer (Version 4) [Computer Software]. Cambridge, Massachusetts: MOTU, Inc.

[4]Kontakt (Version 2) [Computer Software]. Los Angeles, CA: Native Instruments, Inc.

percussion, and finally came to Ball State University to study both percussion and music engineering technology. During this time I added world percussion to my repertoire. After just a few lessons on congas I quickly discovered other specialized and localized percussion from around the world. Studying tabla in India was one of the most advanced steps I made in studying world percussion but chose to exclude it from this composition due to my use of it in many other compositions. I wanted to expand my choices for this piece.

The sound sources were chosen for this piece by looking to my past for what has inspired me and which of those sources would work well for this type of piece. The berimbau was the first instrument chosen. It is a Brazilian instrument, originating in Africa, and is the principle instrument of capoeira.[5] I learned about this instrument through my short training in capoeira in 2002. The snare drum was the second choice due to its early influence from marching band. As a young musician this instrument had a profound effect on the way I approach rhythm, technique, and dynamics. The piccolo snare used in this piece also represents my experience with Moments Notice, a jazz trio I played with throughout college. Lastly, there are three Middle Eastern drums, the tar, dumbek, and riq. The tar is a frame drum with a single head and a hole in the rim for the thumb to hold it upright. It is common in the Middle East, Northern Africa, and the Mediterreanean. The riq is an Egyptian tambourine-like single-headed frame drum, while the dumbek is a Middle Eastern single-headed goblet-shaped drum. I own all three of these instruments are learned to play them during my time at Ball State University.

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[5]Capoeira is an Afro-Brazilian dance-style martial art practiced by the victims of African slave-trade.

India and Middle Eastern Influences

The next major hindsight was a trip abroad. It had an everlasting effect on the way I perceive the world and its various cultures. In March of 2000 I traveled to Chidumbram, India with two other students and a professor to aid in setting up a student exchange with a university there.[6] I chose to include several ideas I gained from this trip in this composition. First, there is the trip to the Indian Ocean at the southern tip of India near Sri Lanka. This particular experience was the conclusion of a seminar given at the Annamalai University Center for Yoga and Meditation and was the reason for the ocean samples included in *Hindsight*. The experience was very spiritual for me as I witnessed the sun setting and the moon rising in a new and powerful place. Second, I incorporated rhythms learned during, and inspired by, my study of tabla. This rhythmical influence can be heard in the quick rhythmic displacements and also includes frequent time-signature changes and rhythmic motives that get faster and closer together. Thirdly, there is the idea of the drone in music. India uses the tempura as a drone instrument that supplies the octaves and fifths as a solid background for performers to play with. I use this same idea throughout the piece. The drone note of the piece is F#. Fourth, there is the tuning and inflections of *Hindsight* which are based on concepts heard or learned in India.

The tuning in this piece is a notable feature. One of the instruments created with the sampling program Kontakt involves a berimbau sample I played and recorded. I took

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[6]I traveled with Dr. George Wolfe to Annamalai University in Chidumbram, India.

this sample and created a twenty-four note equal-tempered scale. Each note is exactly 50 cents above the previous one and the octave is exactly 1200 cents above the original sample. This choice was made to move beyond the equal-tempered scale, which is used almost exclusively in popular music today. My choice to break this down into further scale degrees originated with my interest in Middle Eastern and Indian music and then my studies of the different temperaments and tunings. My initial experience spawning this interest occurred in India as Wing Commander Subramanyan, as he liked to be called, was discussing ragas and tunings with me.[7] Many of the notes in the Indian scales, or ragas, include inflections as part of the scale. In addition, the most highly skilled performers are the ones who have great control over inflections of a single note. I have incorporated this idea of inflection into the use of the sounds in this piece. There is a lot of very subtle, and some not subtle, pitch bending of individual notes. Finally, Middle Eastern aesthetics also have their place in this composition. One of the desirable traits of superior performance is the ability to get as much inflection of a single note as possible, both rhythmically and timbrally. As mentioned above, the inflection of each note is carefully considered.

Electro-Acoustic Music

My first attempts at composing electro-acoustic music resulted in pieces that used *musique concrète* in a fashion similar to the electronic music I was familiar with at the time, which was popular music. At this point I was unfamiliar with the history of

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[7]Wing Commander Subramanyan was the Director of the School of Music at Annamalai University in Chidumbram, Tamil Nadu, India.

electronic music and music history in general. As I became more musically aware my compositions grew more adventurous and focused on art music techniques. This transformation in my musical aesthetics and techniques is another element that I wanted to include in *Hindsight*. This idea is also reinforced by two other factors: attending electro-acoustic music concerts, festivals, and conferences, and also by composing music for a play in which the director wanted popular music with an electro-acoustic "edge." After attending concerts I began to notice distinctive differences among electro-acoustic pieces that in many cases use the same types of technologies and techniques.

The growing popularity of creating music with computers has produced many genres and aesthetics, some of which are closely related and others which are far apart. The goal of this creative project is to fuse the elements of two of these genres and aesthetics: popular electronic music and electro-acoustic art music. To some these can be interpreted as broad terms, so definitions and examples of each of these genres will be given.

To define electro-acoustic music a number of things should be considered regarding its history. There are two distinct developments, both occurring around the same time, that are critical to the history: *musique concrète* and electronic instruments. First, on May 15, 1948, the term "*musique concrète*" was introduced by Pierre Schaeffer in Paris. This term is used to describe sounds, often called "found sounds," which are recorded and then assembled into a musical composition. Schaeffer, along with Pierre Henry, composed pieces that consisted of recordings of piano sounds, percussion instruments, and spoken word, just to name a few, that were recorded directly onto a disc with a lathe. These early pieces consisted of playing back several discs and switching

between them with a mixer. Then, moving to recording onto stereo tape machines, Schaeffer and Henry were able to do additional manipulation of the sound. Built by Jacques Poullin, the Phonogène could control the playback speed of the tape while the Morphophone had multiple tape heads that could produce delays and desynchronizing effects.[8]

During the same time there is another important step in electro-acoustic music: development of electronic instruments. At the beginning of the twentieth century there are a host of new instruments that electronically create sound, such as the electric organ, leading to the RCA Mark II Electronic Music Synthesizer in 1957, and eventually synthesizers created by Robert Moog, Donald Buchla, and many others. These instruments could produce sounds created by oscillators and then modulated or manipulated with other oscillators, filters, amplifiers, etc.

Musique concrète and electronic instruments each experienced popularity and many musical compositions were made using both of them. Some notable composers using these tools to create music are Iannis Xenakis, John Cage, Karlheinz Stockhausen, Milton Babbit, and Edgard Varèse.

There are different aesthetics approaches associated with these early types of electro-acoustic music. First, there is the idea of these types of music being organized in a fashion where the timbre and sounds themselves become the determining factor. In many cases these pieces are devoid of typical rhythmic and harmonic language so familiar to the Baroque, Classical, and Romantic periods. Second, there are pieces in which the determining factor is that these found or electronic sounds are organized with this

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[8]Joel Chadabe, *Electric Sound: The Past and Promise of Electrtonic Music* (Upper Saddle River, New Jersey: Prentice-Hall Inc.), 31.

rhythmical and harmonic familiarity in mind. Third, there are those compositions that exhibit both characteristics. Electro-acoustic composers must also decide whether to use *musique concrète* and electronic instruments alone, together, or along with traditional instruments.

The electro-acoustic music of today is an extension of developments made by the early pioneers, and the term refers to music that incorporates the above-mentioned ideas from the past as well as ideas that are extensions of the past. Currently, there are two genres that are extensions of this past. First, let it be said that both of these can be considered electro-acoustic music: art music, and popular music. These are the two types of music that *Hindsight* combines. The first issue to address when combining different ideas is to identify the main ingredients of each of these types of music.

Starting with electro-acoustic art music we will draw a few general conclusions. This genre uses both historical approaches in the creation of music, *musique concrète*, and electronic instruments. A notable enhancement to these two ideas is their closer integration. New techniques allow for amazingly radical sound design. This art music can involve sounds that are producible by no other means than through electronic manipulation. As far as how these techniques are used, they are highly flexible. A fundamental principle of art music is to always allow for development and not to settle into compositional steady ground or suffer the consequence of being redundant and banal. This music is approached from many different perspectives about what the elements of a piece will be and how they will integrate with each other.

As for popular music, it draws from many of the same wells as art music, though the forms used in this type of music are very limited. Typically it is a simple form that

repeats itself over and over. This also brings to mind minimalism which would apply to a small percent of popular music but would not apply to the majority of it. The dominating approach for composition is to assemble different sounds, quite often based upon actual acoustic instruments, and assemble them in a rhythmic and harmonic fashion that is a direct extension of the music between the Baroque and Romantic periods. Many of the new techniques used by composers developed during the late nineteenth and twentieth centuries are not used by composers of popular electronic music.

Each of these genres is significant in how the technology is interpreted and used by different composers. Today, technology offers a greater number of ways to do things than there are people to do them. An interesting behavior exists among some composers that find the value of music in its evolution and assume that everything currently pushing the envelope is best and therefore superior to that which precedes it. Meanwhile, other composers find value in refining historical trends in a modern vein. *Hindsight* is an electro-acoustic composition that includes ideas from the art music lineage as well as the more selective lineage of popular music.

Several conclusions can be drawn concerning these two types of electro-acoustic music. First, it is easier to find examples of music closer to the edge of the popular vein due to its widespread availability. Secondly, art music composers are drawing from a much richer musical history and therefore have far fewer compositional restrictions and a far greater understanding of the context of their music. Third, the nature of popular music thrives on producing something based on an already proven popular formula and has a much smaller view of history. Lastly, the biggest difference between different genres of electro-acoustic music is based on the composer's ability to assimilate music history.

Selected Influential Composers

During my initial research I sought out other composers that have attempted, or are attempting similar endeavors as well as those that are overlapping the boundaries of both art and popular music. Richard D. James, known as Aphex Twin, was one such artist who floats along the edge of popular electronic music. His music is described more specifically as "ambient techno." His music includes elements of popular dance music, such as electronic sounds sequenced at fast tempi along with a driving drum beat. His music also has characteristics from art music such as carefully effecting timbre with filters and considering the physical space being implied using reverb. His style is influenced by his early career as a techno DJ and growing up in England where he was experimenting with electronics at a young age. His music certainly advances towards the edge of his style with each album. In 1995 Philip Glass even arranged an orchestral version of James's *Icct Hedral.*

Tom "Squarepusher" Jenkinson is another artist who treads close to the edge of popular electronic music. He is known for the electronic music genre "drum and bass." The two main characteristics of this genre are the syncopated use of the drum-set, and tempos ranging anywhere from 140-180 beats per minute. During its early emergence the drum-set part was often played by a synthesizer, due to the extreme tempo, but is also currently played by real drummers. Historical influences come not only from electronics but also from the jazz style referred to as "bop jazz." A notable trait of Jenkinson is to

push his music to tonal and rhythmical obscurity. This certainly is a step away from the typical popular musical molds.

Lastly is an experimental hip-hop producer named Scott Herren, who goes by the name Prefuse 73. He is very interested in creating sonic textures. This element is something very apparent when listening to his music. In a similar style as Aphex Twin, Herren uses filters and equalization in a very effective way as to fully accentuate certain sounds. In addition he imbeds musical and sonic textures within a popular form without simply recreating what could be done with real musicians.

Conclusions

In closing, *Hindsight* captures ideas and events from three major areas encountered during my studies at Ball State University: percussion, the Middle East, and electro-acoustic music. Each part of the composition does not portray any of these ideas alone but strives to incorporate all of the ideas simultaneously. This piece is historically significant because it is a development of *musique concrète* and electronic instruments. It is also important because it incorporates several different ideas that are diverse enough to stand on their own. Many people are familiar with percussion music, music from other countries, and electronic music, but do not always think of these things in the same context. It was a challenge to use these different ideas together in a way that seemed natural. The tools that I used to create this composition offer an incredible amount of flexibility and versatility and allowed me to create a piece of music that incorporates different ideas, which at first, seemed overambitious. Considering the historical

importance of electro-acoustic music and how the technology today allows for a variety of choices it was obvious to me that I should try to integrate several ideas into one composition that does not fit into an already proven popular formula.

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