

Lukas Ligeti as a Unique Electroacoustic Composer-performer:

**With specific reference to the instrument
'Marimba Lumina'**

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Abstract

This research report investigates the role of the musical instrument, Marimba Lumina in the post-electronic music compositions by Lukas Ligeti, musician, performer and composer. Innovative works require new kinds of interfaces and instruments for new modes of musical expression. Post-electronic composers can now redefine their music and find a new musical identity through the advancement of technology. Although tradition has always been a key influence on the expressive level of composers, new trends and technologies have helped to catapult them to greater heights of achievement.

In this research, through the examination of various musical parameters that define and characterise Ligeti's compositions performed on the Marimba Lumina, the application of these parameters will be explored in the context of computer-based music. Technology has had an enormous impact on the world of music creating new dimensions and possibilities to the extent that composers have virtually limitless avenues of self expression through their music. This research report also addresses the issues surrounding "laptop musicians"¹.

¹ Musicians that perform music by pushing computer buttons

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DECLARATION

I hereby declare that this is my own research

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Introduction

Innovative work often requires a new kind of interface or instrument to achieve new modes of expression. Electronic music is a genre that claims to contain both elements of experimental and avant-garde music. The number of acoustic percussion instruments is increasing daily, which means that new technological developments are needed in order to keep pace with creative endeavours.

The Marimba Lumina is a combination of a keyboard percussion instrument as well as an electronic music MIDI² device. The Marimba Lumina is an experimental instrument designed by the American engineer Don Buchla. This instrument resembles an orchestral marimba, but it contains very sophisticated software, and is, in addition, capable of distinguishing which of four coloured-coded mallets it is being struck by. Lukas Ligeti's use of the instrument for composing music in a live performing environment and the resultant soundscapes and pieces make him a unique musician. This instrument interfaces electronically with the computer and plays back MIDI files as well as pre-recorded sound samples. Because of the fact that this instrument is new and the first of its kind, I feel it is important to examine its potential as a distinctive and significant addition to the realm of electro-acoustic music instruments.

Digital technology has redefined the making of music in the second half of the twentieth century and in the new millennium. After the invention of electronic tape during the Second World War in Germany, two central developments occurred, the one advancing pure electronic sound and the other using acoustic sound as a basis for electronic transformation and structuring. Pure electronic music was developed extensively at the radio station in Cologne, Germany, by composers such as Karlheinz Stockhausen and Maurizio Kagel. Lukas Ligeti's practice draws not only from technology but from his vital interest in African rhythms and forms. A point of notable interest about Ligeti's musical activity is that he performed his first experimental work on the Marimba Lumina in Africa at the Unyazi Electronic Music Festival held in Johannesburg in 2005. He again performed soon after this in South Africa on his Marimba Lumina as 'composer-in-residence' at the Wits University Music Division in Johannesburg in August 2006.

² Musical Instrument Digital Interface: A standard form of computer language through which instruments can interface with each other.

The enormous growing practice of the use of electronic music in Digital Arts has contributed to my desire to examine the key elements and key roles that keep this practice effective as a technology-based musical practice. As the result of the digital world changing so quickly, it is important to document these changes as they occur in musical works. Lukas Ligeti uses his digital tools, especially the Marimba Lumina in a very individualistic and unique way, namely as a composition as well as performance tool - hence the importance of examining and documenting this new approach. Taking into account the fact that his music represents an interesting and innovative fusion of Western and African sound worlds that reflects this meshing of two aesthetics, I aim to examine and analyse the way in which his music fits into the genre of electroacoustic music

Chapter 1

Marimba Lumina as a unique electronic instrument

I have played solo electronic percussion music for more than 10 years now, in venues ranging from hallowed golden concert halls to underground clubs to African village beer halls. Interested in the possibilities of electronics, I nevertheless did not want to abandon the kinetic aspect of ‘playing’ an instrument, and wanted to apply techniques learnt through playing drums, so I decided to dive into the world of ‘alternative controllers’ – instruments which are neither laptop keyboards nor piano keyboards, with which to control electronics. Initially I used the Drum Kat, an instrument consisting of various pads on which one could play with drumsticks, but for about a year now, I have used the Marimba Lumina, a rare experimental instrument designed by the American engineer Don Buchla. Resembling a marimba, it has very sophisticated software, and is, for example, capable of distinguishing which of four coloured-coded mallets is hitting it (Program Notes by Lukas Ligeti from a performance at the Wits University Johannesburg August 2006).

Innovative work in electronic music requires new kinds of interface-instruments. This is because technological advancements always produce something new at a relatively fast rate of change. As a result, new innovative work demands the challenge of finding the appropriate tools to give expression to new ideas. Marimba Lumina is a good example of an innovative instrument because, when we talk about the Marimba Lumina we cannot ignore the fact that it is a technology-driven instrument. The fact that this novel instrument also resembles the conventional orchestral Marimba yet demands new ways of playing it makes this instrument unique in its fresh offerings to creative musicians. It encourages and demands new ways of thinking about musical instruments in terms of their performance and composition. In this chapter I will be discussing the role of Marimba Lumina as a unique innovative electronic instrument in the realm of new musical technological inventions. Because technology is never static, I am arguing that post-electronic composers are highly challenged to move away from their traditional practices to the new technological changes in order to adapt their musical ideas to the technological spectrum of possibilities.

Taking the introductory notes quoted above from Ligeti’s performance at the Atrium Wits University Johannesburg in August 2006, and considering his statement that he never wanted to “abandon the kinetic aspect of ‘playing’ an instrument”, one can see that he is determined not to be considered just a

‘laptop’ musician but rather a musician that pushes the boundaries way beyond the so-called ‘laptop’ musician. Laptop musicians for example those who performed at the Unyazi Festival 2005, namely: Pauline Olivieros, Rodrigo Sigal, Matthew Ostrowski, Yannis Kyriakides, James Webb, Warrick Sony and Brendon Bussy, were mainly interested in creating the music through pushing computer buttons and allowing the computer give the ‘performance’, whereas Lukas Ligeti was interested in his own performance creativeness using the laptop as a controller.

Retaining the element of performance on an instrument has always been a motivational tool for Ligeti and to be able to push the boundaries beyond the limits and to take contemporary music so much further. Ligeti believes that being just a laptop musician is very limiting because of the absence of energy during a live performance. In addition he wanted to keep the performance element in his music in order to showcase a myriad of skills and techniques that he had learned as a drummer/percussionist.

There is ongoing debate about electronic music due to the rapid and vast technological changes and discoveries. The Marimba Lumina is an important and a distinctive instrument in the realm of electro-acoustic music since it has not previously appeared as an adjunct to the computer. New developments in technology suggest breakthrough ways of musical representation and expression, and as Griffiths so aptly stated, “A new musical architecture demanded new material, not refashionings of the old” (Griffiths 1995, 45).

Griffiths points out that there has been a lot of innovative work done before, which also offers different ways of expression but his point is that as technology advances, new developments in music are required for new expressive purposes.

Moving away from an old performance practice to a new kind of performance practice, demands a great deal of careful planning, especially if it has not been done before. At the time that Ligeti learnt about the new Marimba, he was a bit nervous to venture into using it, but he saw this as a challenge to which he could rise to since he has always been interested in new things and innovations in his music. It was fortuitous that the timing was right for Ligeti to embrace performance on the laptop together with an instrument. There are always problems involved in getting to know how to play a new instrument. Starting to master the Marimba was a bit easier for Lukas because he is a percussionist and this is a percussion instrument. He says, “I had the feeling it was the right instrument for me to use at

the time. I was a bit nervous about not being able to finish enough music before Unyazi so I worked as hard as I could”

Ligeti saw possible ways to extend his technique and creative tools through this innovative instrument called Marimba Lumina, since it facilitated his being able to perform together with his bass drum kit. In his own words,

I'm a percussionist and wanted to keep/extend percussion technique in my electronic playing. And the Marimba is the most flexible electronic percussion and a controller I have found so far. I was looking for a way to combine the possibility for intuitive melodic improvisation with the other features of a percussion controller. So a controller with a mallet instrument paradigm seemed the obvious choice. The only other such controller on the market as far as I know, the Mallet Kat, has much less sophisticated software and therefore really didn't 'do it' for me. I used exclusively (and still sometimes use) the Drum Kat percussion controller, which is a smaller, more drum-set-like electronic percussion controller but with very advanced software. It is made by the same company (Alternate Mode in Massachusetts, USA) as the Mallet Kat, but unfortunately they do not put the same advanced software into the Mallet Kat. The Marimba Lumina combines flexible programming possibilities and very advanced software with a mallet paradigm (e-mail correspondence: Monday, 20 November 2006 03:31:44)

The need for innovative works and new kinds of instruments like the Marimba Lumina is motivated by the enormous increase in the developments of technological equipment and computer advancement. Computer technology has changed the concept of musical events from natural acoustic instrumental sounds to “the idea of music as sounding numbers” (Griffiths 1995, 207). As technology was developing, the challenge and imperative for composers was to adapt to new ways of making music, which meant moving away from traditional performance and composing practice to a culture of electronic practice; the realm of computerized music became pivotal for post-modern composers.

New modalities of innovative work interrogate the kind of interface that is suitable for producing new results, and also what the interface would add to the genre. Does the interface suggest an entirely new way of thinking about music or is it simply a replacement for what was there before but now facilitating an improved level of musical thinking? The manner in which Ligeti uses this instrument

answers this question in a very simple way. His use of pre-recorded loops³ and MIDI already shows that the interface suggests a new way of thinking about music and a new means of expression.

One source of today's postmodernism, not surprisingly is the psychological and sociological tenor of our technology-saturated world. Technology has created a context of fragmentation, short attention spans leading to constant discontinuities and multiplicity- all characteristics not only of contemporary society but also of post-modern thinking (Lochhead and Auner 2002, 19).

This instrument introduces and addresses innovations in improvisation technique and also about novel approaches to computerized music. Lukas Ligeti uses the Marimba Lumina (hereafter referred to as the ML) in his music as a controller interface and states,

The ML is definitely in the tradition of "alternative midi controllers", that is to say, MIDI controllers that are not keyboards. Each designer adds his/her own features as they see fit and technically feasible; Buchla (the designer of the ML) has done the same. It is a self-sufficient instrument and doesn't need a computer. It even has a large number of built-in sounds because it includes a Yamaha XG sound module. The sounds are rather uninteresting, but if you want to imitate an acoustic marimba, it can be done with the inbuilt sound module, and of course through the flexibility of the instrument, the playing possibilities are still very different and richer than on a conventional marimba, while of course the sound is much more stereotypical than when playing the non-electric counterpart. It is also possible to interface the ML via MIDI with samplers, synthesizers, etc. I use the computer because it's the most flexible and convenient, (has) more timbral and control possibilities and memory, etc. in a smaller lighter package than carrying around a bunch of hardware samplers and synthesizers (e-mail correspondence: Friday, 19 January 2007, 03:41).

A composer like Stockhausen has attempted to use traditional instruments in an innovative way that would produce an entirely new sound experience. However, it is slightly different from playing an ordinary instrument, since the effect is achieved through playing an instrument with a different technique, rather than playing a completely new instrument to achieve a new means of expression. A composer like Lukas Ligeti was brave enough to challenge the performance practice of old instruments by introducing new and unique instruments via the computer. Reginald Smith Brindle says that many contemporary composers have moved towards using percussion instruments in order to explore other timbres and textures. He says using percussion instruments in combination with other sounds can

³ Sound loops that Lukas Ligeti records with his take recorder when he is travelling around places, this sounds are manipulated with the composed sounds in the laptop to bring about a new form of sound.

create a whole new world of rich aural delights. This is most particularly found in tuned percussion and enhances the musical expression of a composer's music.

He states that,

“Tuned percussion instruments of the xylophone family have established a leading position among percussion instruments because of their dual (melodic and colouristic) character. Composers have seized on these instruments with particular enthusiasm during the present period of radical stylistic transformation and search for means of expression. For they can effectively produce a new sound panorama (quite different from ‘classical’ orchestral sound) which suits the ethos of contemporary musical expression” (Brindle 1970, 25).

Smith-Brindle re-looks at the use of percussion instruments, specifically contemporary percussion instruments in a way that changes people's perception towards percussion instruments in general. He states that percussion instruments are under-valued and their potential underestimated since many musicians do not regard them as avenues of exploration and only use them for extending timbral sonorities.

According to Roads, composers are regimented by what the computer software can offer them. He argues that there are three major factors that play a role in computer music:-

“First, the computer offers powerful possibilities for constructing a new sound world (far exceeding those offered by traditional instruments or analog electronic means) and for controlling with the greatest care and precision the minutiae, the atomic structure, of sounds themselves. Second, the computer suggests new ways of thinking about musical structure because of the unprecedented facility for unifying macro-and micro levels of a composition. The machine gives the composer the capability of applying analytical and theoretical concepts expressed as compositional algorithms or programs, prompted by the necessity of organizing the new sound world that has become available. Third, by establishing an interaction between the composer and technology, the computer stimulates thought about the compositional process itself and suggests a new relationship between creator and material with the computer functioning as a more or less active intermediary” (Roads 1985, 90).

Peter Manning argues that many composers are “primarily motivated by a desire to transfer studio procedures to the concert platform in a manner which was not limited by traditional performance practice” (1985, 187). Composers are motivated by different reasons when deviating from the so called “old fashioned” instruments to something new in their music. Some composers use traditional instruments to produce a new musical effect by stretching an instrument beyond its natural abilities in order to produce an electronic effect. Gyorgy Ligeti, father of Lukas, composed much of his music in

this very manner. In the early times of the electronic music movement, composers started by using the natural acoustic sources they had to produce electronic sounds. Manning says that early practices of electronic music depended on natural sound sources for their production, with the intention of achieving better technical results. Manning goes even further by saying that composers have different objectives for their own electronic sound: “Their primary objective lay in the development of performance techniques which would produce sounds of an electronic nature from these natural sources for example, high squeaks from wind and brass instruments and bowed percussion” (Manning 1985, 192). As far as Ligeti knows there are only three players who play the Marimba Lumina and also according to him the maker of this instrument is not really responsible for maintaining the instrument. He says that,

I promised to explain why only about 3 people play the ML seriously. The truth is that its builder, Don Buchla, has no business sense and does nothing to market the instrument or to accommodate potential buyers. Also, if it breaks, it's difficult to get him to repair it. He is, let's say it politely, something of an eccentric. Beyond the problems specifically associated with Don Buchla, electronic percussion is a small world. There are some remarkable products out there, very creative like the Drum Kat and very advanced like the Roland V-Drum which is amazing if you try to emulate an acoustic drum set. I don't know who, exactly, the clientele for electronic percussion instruments is. Recording studios? Giggling musicians who are too lazy to lug around a big drum set? I honestly don't know; I see them mainly in stores. I know of very few people who play electronic percussion artistically. One player I would mention is Amy Knowles from Los Angeles who does remarkable things with a Drum Kat. There is also Joel Davel who works for Buchla and was involved in designing the ML. But generally, electronic percussion seems to have had a limited impact, and overall, MIDI has gone somewhat out of fashion over the past 10 years, with the rise of laptop-based performance. Of course, laptops have the flexibility and transportability mentioned above, but I still feel there's an important place for MIDI controllers as they allow for more motion, for a more kinetic playing approach that gets lost when performing just on laptop. Most electronic musicians don't seem to care much about that, however. (e-mail correspondence: Sunday, 24 December 2006, 22:21:02)

Most post electronic musicians do not rise to the challenge of moving away from practising their music as laptop musicians. This is one challenge that Ligeti did rise to by using a computer together with the ML instrument, which makes him rather unique as an important composer/performer. Lukas believes that there is a lot of musical expression that is lost when one is performing just with the laptop, since there is so much more flexibility in sound when using a MIDI controller. Ligeti chose to go beyond the title of “laptop musician” and take an experimental stance, because as a percussionist, there is so much potential for a unique performance by using his feet while doing something else with his hands on the

ML and in addition manipulating the computer at the same time. When the hands are playing, the feet can keep the beat while the computer keeps on cycling with the programming of the song.

The “laptop” performance prevents a performer from being able to explore sound with his/her whole body and also limits his/her engagement with the audience. This is because when one is playing with the laptop the whole musical energy becomes submerged in the computer the ‘music’ only reaches people’s ears through speakers rather than through a performer’s energy; the audience does not see a performance, rather it sees a performer sitting with his/her laptop manipulating buttons. This is vastly different from Ligeti’s performances since he engages with the audience with his body, and his whole bodily energy is expressed and seen when he is performing with the ML. The audience can see where the sound is coming from, since it can clearly distinguish which of four coloured-coded mallets is striking the ML.

When Lukas Ligeti speaks of kinetic energy he is referring to kinetics simply as movement or motion produced by a performer when performing. This reinforces his belief that playing an instrument is something that should not be neglected if one is a trained musician. He says:-

I figured I'd spent some time learning how to play drums and it would be foolish to just abandon that when using electronics. I was wondering how the use of electronics might change and develop my percussion technique, so that there would be a feedback between electronic and acoustic playing (I play the normal drum set a lot, do some 50-80 gigs an average year playing jazz drum set). Also, I find it much more interesting to watch someone play on stage if they actually move, rather than typing into a computer keyboard, and if I can somehow link the motion I see with the sounds I hear...it doesn't have to be a direct link, but I do prefer to see some connection. I think this is actually a big challenge in electronic music performance, this question of linking what the audience sees with what they hear...but most electronics performers are not interested in this problem at all for some reason, which is also one of the reasons why MIDI has gone a bit out of fashion. (e-mail correspondence: Thursday, 25 January 2007, 01:07:29)

Lukas Ligeti is trying to change the practice norm of laptop musician, which tends to be quite monotonous and boring at times; it is not as interesting to watch someone pressing buttons and moving a mouse to perform as watching someone playing an instrument. He says,

There has emerged a certain aesthetic among laptop performers - very minimal, mainly timbrally-oriented among the non-pop people; mainly mechanical beats among dance people. These approaches are not specifically connected with the laptop as far as I can see; many other things could be done with it. The problem I see with laptops is that if you only play a computer keyboard, movements will be very small; a certain kinetic aspect gets lost. I'm interested in motion that I can feel strongly and others can see, and I'm interested in what happens with instrumental (in my case percussion) technique when it's interfaced with a computer; therefore, I like using an instrument such as the ML rather than just a laptop (e-mail correspondence: Thursday, 28 December 2006, 08:17:00)

Ligeti projects a new form of practice into a live performance through playing the ML together with a laptop, which adds to and goes beyond the tradition of laptop musicians. Without the added dimension of the instrument, he sees this as a major deficiency, which is why he expresses interest in the technical aspects of the instrument as well as the vitality that is communicated to the audience through the action of seeing the ML in a live performance.

The move towards developing a variety of new technological equipment and instrumental tools was motivated by the creative idea of producing new kinds of instruments to generate innovative work; as Norman states, "There's less money in the small world of experimental music, but the early history of electronic music in the 1950s and 1960s was certainly pioneering in terms of putting technology to diverse creative ends, and this glorious appropriation has continued into software and instrument design" (Norman 2003, 3). This movement then led to many creative interfaces/instruments being produced. Other manufacturers preferred to work with individual composers to provide for their specific needs and demands.

The manufacturer of the ML did not use the ML as a business opportunity – the instrument was simply the result of his interest at the time but he was not concerned about producing a great ground-breaking instrument especially developed to transform musicians into new ways of thinking in the post electronic culture. Ligeti remarked that he did not even have time to mend it.

When I asked Ligeti if the instrument was made especially for him and his own musical practice, he said the following to me "No, he did absolutely nothing specifically for me. I asked him if he'd build one, because he had run out of new ones to sell me, and he wouldn't do it. It then took me more than a year of detective work to find one. As I said, the big problem with this instrument is that the designer has no interest in the fate of his instruments once he has designed them, which is a pity" (e-mail

correspondence: Wednesday, 18 April 2007, 21:43:06). Ligeti persevered in his search for this unusual percussion instrument as he believed that this very model was the ultimate vehicle for forging new musical/electronic frontiers of composition.

Composers have different objectives and different imaginative space for their work, which is why new kinds of interfaces/instruments are required to suit their own aesthetic thought. Norman says the need for electronic instruments by composers in their work is driven by the need to create a new world of sound within the electronic realm. He states that, “an electronic music is developing in which not only sonic, but aesthetic, objectives are driven through the ‘aid of electrical instruments’” (Norman 2003, 3). Composers always look for new modes of expression that could make them unique and great composers. Electronic music is, for many composers, still foreign and new, more especially to those who have never been exposed to the making of music through computers. There is still much room for contemporary composers to experiment using technology to advance their musical horizons and to find new ways of expression in their music.

In a nutshell, the ML has proved itself to be a unique and innovative instrument through its technical ability of being able to interface with the computer and to play MIDI files as well as other pre-recorded sound samples.

Chapter 2

The use of MIDI interface

This chapter will discuss the history of MIDI interface from its early use in the role of digital music to the point where it is used in the performance practice with the Marimba Lumina by Lukas Ligeti. Christoph Cox and Daniel Warner talk about the technological capabilities as something that play a role in the way composers compose. They state that “tools now aid composers in the deconstruction of digital files: exploring the sonic possibilities of a Photoshop file that displays an image of a flower, trawling word processing documents in search of coherent bytes of sound, using noise reduction software to analyze and process audio in ways that the software designer never intended. Any selection of algorithms can be interfaced to pass data back and fourth, mapping effortlessly from one dimension into another, in this way, all data can become fodder for sonic experimentation” (2005, 397). In other words, Cox and Warner maintain that composers are also controlled by the limitations that technology offers them. Composers always want to push the boundaries beyond the limits as a way to find new forms of expression.

1. The history of MIDI up to the time of Lukas Ligeti

The growth in technology was motivated and encouraged by the need for changing the world into a better place through technological advancement; in the world of music this growth and development was directed at finding new kinds of instruments that would improve the sound or that would enable composers to explore whole new sound-worlds. Technology developed as a visionary imperative to facilitate an explosion of fresh aural possibilities. This vision imagined a future in which any sound at all could be used musically, creating a world where composers have limitless options and possibilities, dictated only by their imaginations.

Katharine Norman argues that,

The early history of technology and sound is a mass of interesting presences, discrepancies and confusions. There were dreams of money, and there was the crackle of creative interference in the air. Reading back through the evidence, it sometimes seems as if the late nineteenth and

early twentieth centuries bred a bunch of particularly irascible and avaricious pioneers, who fought it out over prestige and cash in equal proportions. Those early years of invention and growth were a mass of small, aggressive ventures, rising in a constant buzz of connected and disconnected possibilities. As invention after invention was demonstrated (and patent after patent was filed) one thing often led, by tangents, to another. The end result was sometimes a surprise; for instance, technology developed with the deaf in mind evolved into the telephone. Suddenly the world was becoming a place where it might be possible to stay in touch with everything at once, and pick up the phone, hear the film, play the record, tune in the radio” (Norman 2004, 3).

The movement that led to the MIDI invention began in the early 60s with the aim of connecting various types of electronic instruments digitally. According to Michael Boom the origin of MIDI did not “magically appear one day on synthesizers and other equipment. It resulted from the hard work of many people and from agreement and compromise and the world’s major musical instrument manufacturers” (1987, 9). He argues that to understand how MIDI came about, one needs to understand the history of synthesizers, because it was through synthesizers’ development that it came about.

Boom furthermore argues that “Synthesizers have been around almost as long as electronic loudspeakers have existed. The first instruments to create music over loudspeakers, without merely playing back pre-recorded sound, appeared as early as 1906. By the 1920s, advances in technology yielded two popular synthesizers, the Theremin and the Ondes Martenot, as well as numerous other experimental instruments” (1987, 9).

Through technological advancements many other synthesizers were emerging from time to time since the early thirties to the fifties. Composers then began to experiment with synthesizers in their music. People of that time were not used to the sound of synthesizers; as a result they displayed antagonism to the sound because of their ignorance. People only started to accept and like the sound of the synthesizer when they heard it more frequently in early movie scores of the time. Boom says that “by the early seventies, synthesizers had made their way into rock bands” (1987, 10). The more the demand grew by people wanting this synthetic sound, the more the manufacturers searched for new methods of developing the sonic range of the synthesizer; this then yielded the invention of MIDI, as new and urgent needs emerged for immediate and fluent communication between instruments of different kinds. This switch from the use of synthesizers alone to the use of the MIDI interface was

determined by the demand for connecting instruments of different kinds by different manufacturers and to standardise the digital environment.

It was in 1981, when this change to another musical code of behaviour took place and was called “MIDI”. MIDI protocol demanded new kinds of approaches and adaptations when it came to musical communication, since it was new for the time. Composers had a glorious opportunity to begin exploring with all sorts of innovative musical languages. Boom argues that, “in 1981, three men working with synthesizer companies, Dave Smith of Sequential Circuits, I. Kakehashi of Roland Corporation, and Tom Oberheim of Oberheim Electronics” sat down to “discuss the possibility of creating a standard for synthesizer control so that synthesizers from different companies could talk to each other without difficulty” (1987, 11).

After the discussion they agreed to use MIDI as a standard that manufacturers of electronic musical instruments would use so that instruments from different companies could talk to each other with ease. MIDI stands for ‘Musical Instrument Digital Interface’. The reason why this standard was called MIDI was because it is an acronym that includes all the functionalities that take place in MIDI when processed digitally; this means that instruments would be able to send and receive MIDI messages from each other. The computer can also understand MIDI code since MIDI code is a bunch of musical events that are sent via MIDI port as sound signals. MIDI then became a language that manufacturers of different companies agreed to use as a standard protocol for musical interface communication.

Selfridge-Field says, “MIDI originated as a real-time protocol to enable communication between separate hardware devices (e.g., between two electronic keyboards or between an electronic keyboard and a personal computer). Specifically the intent was to make sound-wave frequency and duration-of-depression information obtained from an electronic keyboard interpretable across devices” (1997, 42). Selfridge-Field’s argument is similar to Boom’s regarding MIDI being a protocol that was agreed on as a standard for communication between instrumental devices created by different manufacturers. The emergence of MIDI was brought about by the need to interface instruments by different manufacturers, so that musicians could still ‘jam’⁴ and perform with other musicians with instruments manufactured

⁴ Improvise together.

by different companies. Since 1982, almost every manufacturer felt the need to create instruments with a MIDI port so that they could interface with other instruments that understood MIDI messages.

Boom, moreover, contends that “Since 1984, MIDI has been stable enough to make its mark on the music industry. The Yamaha DX7, one of the most popular synthesizers ever sold, was also one of the first to include MIDI. As users found out how convenient MIDI was, they began to demand it on other instruments, as well” (1987, 13). Using MIDI during this time was in the experimental realm because it was still a new phenomenon for most composers and musicians.

Computer users quickly recognized the potential and opportunity that MIDI presented: “A digital interface sending data in a form perfect for use with a home computer. And software companies, notably Passport Designs, led the way with MIDI software to control synthesizers from a computer and to help synthesizer owners do things not possible with their own two hands” (1987, 14). Musicians who were already using computers at this time started experimenting with the MIDI interface for new musical expression. Composers started to explore electronic sounds with the aid of a MIDI connection in order to creating a new sound-world in their music.

As time went by the MIDI interface became more and more usable to the point where data transmission and hardware interfacing became possible with different kinds of electronic instruments. Instruments made by different manufactures started communicating with the MIDI interface with no problem. Musicians could ‘jam’ with other musicians using instruments from different manufacturers through MIDI interface. Eleanor Selfridge-Field states that MIDI “may refer to a hardware interface, a file format, the data in a standard MIDI file, or the instrumental simulation specifications of General MIDI” (1997 41). The word MIDI is a word that embraces many things in one, which means that it includes a process of interfacing two or more devices at once as well as the data transferring process.

According to Jeffrey Rona “from the beginning, the MIDI standard was designed with room for growth and improvement. Since its start, new features have been added, while others have been defined more clearly. A great deal of room was left for expansion without sacrificing the main power of MIDI simplicity and compatibility with all other existing MIDI instruments” (1994, 7). He says that “the word MIDI is used to describe both the information being sent and the way it is sent. MIDI is the

messenger and the message. MIDI is a musical language (software), but also is the cables and connectors (hardware) used to send the language from one device to another” (1994, 29)

The connecting thread that led synthesizers to MIDI, and MIDI data to computer, to the Marimba Lumina via MIDI ; Lukas Ligeti continued the momentum of this growth as he was driven by the need to create new kinds of interfaces/instruments for his innovative work. MIDI to this day is the architect for achieving new kinds of electronic instrument interfaces in post-electronic music.

2. The use of MIDI by Lukas Ligeti



I really like performance and when I go to a concert I don't like to sit in front of a couple of loud speakers, I like to see somebody perform, and myself also. I thought it is great fun to perform and I thought that having sweated to learn to play drums and to learn to work with sticks, and that I somehow wanted to use that technique also in the electronic realm; and to see what happens to this technique if I use the possibilities of electronics. For example, most of the time when you are playing drums you are worried about starting notes (starting sounds) not ending notes, because they usually decay quite quickly. But now with electronics I can start the sound as if I was playing drums but then I also have to think about ending the sound - so how do I end it? Is it just another hit - what happens to my drumming technique if I have to make two hits further? So I was interested in questions like that! (Interview with Lukas at Wits University on Monday 25 August 2006).

Lukas Ligeti says that he thinks that many electronic composers are primarily interested in sound but that he is more interested in the broader range of possibilities that electronics offer. He says,

I am also interested in sound, but more than that I am interested in electronics in many other ways. I am very interested in electronics as a performance and to do types of performance that couldn't be done without electronics; I am also interested in electronics in terms of the possibilities relating to rhythm, tuning elements, melodies, harmonies and aspects like that. The use of electronics for timbre is incredibly dominant with most electronic musicians, but for me it's just one of the very many possible uses of electronics. Generally speaking many electronic experimental composers are mainly associated with timbre; I am concerned with timbre only among other things. An extremely timbre-orientated approach has never been my road. That is also why I really like MIDI; a lot of electronic experimental composers these days don't use MIDI because they are not really interested in the performance aspect of controlling the music with a laptop keyboard, which is a lot faster in many ways (Interview with Lukas at Wits University on Monday 25 August 2006).

The driving force for Lukas Ligeti's need to be creative and to search for devices that would make him even more unique, is the challenge to be without boundaries and restrictions in his creative process. He says that from the very beginning of his music-making, he was conscious of what he wanted to do with his music; his main interest was to forge new directions and to discover new sound-worlds. He says furthermore,

"I think I have a talent to come up with new ideas and I think in a way that is different from a lot of people. I have a completely average musical talent when it comes to imitating notes; my strength is that maybe I have some sort of originality. My interest in music was always to try out new ideas and see if they work, from (the viewpoint of) my taste, so that is what experimental music means to me. I am an experimental musician in everything that I do. It's not always experimentation in the musical content - it can be social experimentation" (Interview with Lukas at Wits University on Monday 25 August 2006).

Lukas uses many programmes for his music, for example, Logic and Native Instrument Contact, which is a very sophisticated sampler. Ligeti plays the samples back from the computer using the very sophisticated programming possibilities of the Marimba Lumina and the advanced technology of Contact, which he chose as his software and sampler for his computer. He says "the reason that I have chosen Contact for my music is because it is reasonably easy to convert sample libraries from the archive sampler to Contact" (e-mail correspondence: Wednesday, 18 April 2007, 21:43:06)

Another program that he uses is Ableton Live, which is very useful for taking any kind of sound file and playing it back as a loop. He states,

“I don’t work a lot with loops, but I have it stored as a loop and then I can trigger these samples from the Marimba Lumina. Ebonite Life is a very easy and clear program to work with and it’s easy to maintain. I compose a lot with Sequencers like Logic, but I don’t have any set approach to composing, so it mainly depends on what I do. Sometimes I compose electronic music that is not for performance, then I will mainly compose in Logic; sometimes I compose, like for classical musicians with head and pencil and paper, sometimes I use the piano and sometimes I use a notation software like Sibelius” (e-mail correspondence: Thursday, 28 December 2006, 08:17:00)

Ligeti displays a certain aversion to watching a composer fiddling with knobs and buttons:

A lot of laptop performances are improvised by just pushing buttons on the laptop. I get a little bored when I see people sit behind a laptop back in the office just pushing buttons; I don’t know what they are doing. If I see myself playing Marimba Lumina I know at least there is some relationship between motion and sound and I see somebody moving and somebody performing; for me the important thing about this is just the experience. A lot that I do in my electronic music is based on movement. I learned patterns of how I move on the instrument and then I can change the sound, but the movement would still be the same movement and that is a very African technique. I have just found that a lot of approaches in African music and a lot of approaches in electronic music are actually quite compatible. That is one of the reasons why I have continued also being interested in this combination of African and electronic music (Interview with Lukas at Wits University on Monday 25 August 2006).

The manufacturer of the ML designed it in such a way that it should be able to understand the MIDI language and be able to communicate through MIDI messages, and that it could interface with other devices that understand MIDI language as well. The fact that the ML was also created to understand MIDI messages means that it has the capability to send and receive MIDI messages with other electronic instruments/devices interfaced with it. Lukas Ligeti uses MIDI as well as pre-recorded sound samples when performing with the ML. The ML can interface with any other instrument that can send and receive MIDI data since it is a MIDI interface itself.

The individual way Lukas Ligeti uses the MIDI interface suggests a new approach in the realm of interfacing new kinds of electronic instruments within the new world of technology. This is because he incorporates the use of loops with MIDI materials that he has composed to make up a new sound-world. Lukas Ligeti is not just interested in making music by playing back pre-recorded loops through

the MIDI interface, but he is more interested in the unpredictable and startling sound revelations that occur during a live performance. There is an exciting element of ‘chance’ in this kind of music ‘performance practice’ because it is mainly dependent on improvisation as the tool that carries its meaning. It is this improvisational tool that leads the music into uncharted territory.

I asked Ligeti about the method he applies using MIDI and what role it plays in his compositions - also how he blends MIDI with the Pre-Recorded loops that he uses. He answered with the following “MIDI is a protocol that enables my live playing to interface with my computer. Of course whatever technology you use, it'll have an influence on your music, with all its possibilities as well as limitations. You always think "in a certain language". I use few loops actually; it's just that some of the samples are awfully long and I've done things to them, like layering, that make them sound loop-like” (e-mail correspondence: Wednesday, 03 January 2007, 23:59:09)

Lukas Ligeti has a clear understanding as to why he chose to use MIDI in his electronic music –it was in order to interface the ML with the computer program that he uses during live performance. It was during one of my interviews that I discovered that Lukas Ligeti regarded the Marimba Lumina as the magical tool for achieving something completely new and unique. His use of the ML as a most unusual instrument distinguishes him from any other composer. I asked him to explain how the Marimba Lumina interfaces with the computer software in his live performances. He explained the following to me: “It's via MIDI - I go from/to the ML via MIDI cables to a MIDI interface box, and from there via a USB cable to my Mac” (e-mail correspondence: Monday, 20 November 2006, 03:31:44).

When I asked Ligeti if he could explain why he chose to use MIDI and not some other technological method, he explained that

“Midi is a convention; it's used universally by most types of electronic music equipment where inter-equipment data transfer is relevant. Midi has gone a bit out of fashion because most people these days try to do everything solely with their computers. However, where ‘outboard’ gear is used, and this outboard gear has to be communicated with in ways exceeding the simple sending of sounds as such (i.e., where data has to be sent rather than just analog sound), MIDI is essential” (e-mail correspondence: Thursday, 25 January 2007, 01:07:29)

The use of MIDI in the late 20th century led to an advanced level of experimentation with electronics and electronic instruments together with other technological devices. Body movements and gestures have become part of music-making in electronic music experimentation. Gestures and body movements add new forms of expression to post-electronic music with the aid of technological devices. Incorporating body gestures and movements for sound control has become common practice for contemporary post-electronic composers. Matthew Ostrowski, for example, one of the electronic music performers during the Unyazi festival in 2005, used gesture movements with a ‘virtual glove’ through the MIDI interface to control musical dynamics in a live performance. This reinforces and further demonstrates the need for new investigations, inventions and discoveries in post-electronic music-making. Composers have become entrenched in the same compendium of sounds and the same kinds of instruments for many years; technology is presently taking music to a different level of new instrumental discovery and new sound-world discovery:

“Matthew Ostrowski has been using electronics since the early 1980s. In an attempt to bring a truly instrumental quality to live computer music practice, he has developed a system based around the P5 glove, a commercially available video game controller. This device is connected to a Max/MSP program of his own design, which uses principles of physical modelling to control musical parameters. By manipulating virtual objects in a multidimensional parameter space, his instrument brings some of the nonlinear behaviours of physical objects into the electronic domain.” (<http://www.slought.org/press/11326/> - accessed on March 13 2007)

The picture below demonstrates Matthew Ostrowski performing with the P5 Glove



According to Peter Kirn the glove that Ostrowski uses was originally created as a musical device that would evoke new kinds of musical expression. He says that, “in fact the original data glove (by T.H. Zimmerman and J. Lanier) was designed for playing (the) air-guitar like Jimi Hendrix, so it is originally a musical device”. (<http://createdigitalmusic.com/2005/04/11/p5-data-glove-and-music/>-accessed 24th March 2007)

Eleanor Seldfidge-Field maintains that “Augmented MIDI is a proposed plan of extensions intended to provide more flexible control of some expressive factors in live performances which use standard MIDI files as scores” (1997 ,105). This means MIDI language has developed to a point where gesture movements of a performer can be considered to interpret musical expressions through data transmission. She furthermore says that “the basic idea is to add a few bits of information to the MIDI file which will be combined with the information obtained from gestures of the performer. For example, some notes may have an accent bit added, in the performance, the actual strength of accent will be determined by a gesture such as the position of the performer’s left hand” (1997, 105).

Seldfidge-Field points out the fact that the usage of MIDI has improved a great deal since its discovery, implying that there is still more room for experimentation with body movements and gestural expressions. Technology has facilitated the advancement of MIDI language to a very high level, a level at which composers like Lukas Ligeti have room to explore MIDI usage in processes hitherto unsought, thus creating fresh musical significances through gestures or body movements in live performance. This serves to emphasise that Lukas Ligeti embraces as a tool, the kinetic energy generated by these new movements as well as the transmission of this energy from the performer to the audience during a performance of his electronic compositions. Since MIDI is capable of transmitting data information through electronic cables, it has become possible for post – electronic composers to explore many new modes of expressions similar to body and gesture movements.

To sum this up, MIDI is fundamental to the process of interfacing instruments of different kinds, but more especially in engaging with new kinds of instruments that require a new form of interface with the computer like the ML. The development of this form of MIDI interface has constantly redefined the practice of new post-electronic music. This is because post-electronic music depends largely on

technology for new modes of musical expression. MIDI has therefore become the medium for interfacing different instruments made by diverse manufacturers and has become indispensable to composers. Gesture recognition through MIDI data interface has become a new language and musical material usable for creating new forms of musical expressions.

Chapter 3

Tuning and detuning flexibility

Influence of tuning systems from African Music

Ligeti has been strongly influenced by African musical forms and sounds which impacted heavily on his musical taste and style. The ‘call’ to come to Africa by the Goethe Institute encouraged Ligeti to familiarise himself with the use of African forms and rhythms; he had always wanted to work with African elements in his own music. The journey to Africa changed his perspective in terms of his imagination and perception of African polyrhythmic patterns and cyclical structures. Tuning systems have always fascinated Ligeti to the extent that he has often explored both tuning and detuning systems in his electronic compositions. Ligeti takes pleasure in the fact that in most African music systems there is no such thing as a standard temporal tuning system for instruments as exists in Western tuning. He is delighted that African tuning systems can be anything that the musicians desire depending on what sounds they want to achieve.

This chapter will provide detailed information that clearly distinguishes between African musical practice and Western musical practice as described by Lukas Ligeti. Once someone goes beyond his/her traditional musical experience to embrace the music of ‘another’ it becomes difficult to tell exactly what elements begin to shape their musical style or influence their musical intention and direction. Different cultural and traditional music practices can have an enormous effect on a composer.

Lukas has always desired freedom of expression in his music and it is precisely in African musical forms and patterns that he found a fulfilling sense of freedom of expression for his music. One of the aspects that inspired Ligeti the most was the unusual tuning systems of African music. Since in most African musics there is no “right” way of tuning or playing an instrument as there is in the Western art music tradition (where a standard temperament for tuning instruments exists), Ligeti wanted to experiment with so called “Western-tuned compositions” in conjunction with African ‘differently tuned’ compositions. In African music, tuning is dependent on the individual performer and how s/he

believes a particular instrument in his/her village should be tuned. Lukas experiments a great deal with these kinds of tuning systems in his music thus demonstrating a great sense of freedom in his electronic music. He uses the computer to 'detune' an instrument in order to achieve a certain effect. The computer enables Lukas to achieve the experimental element in his music – it allows him to play the same melody but with a different tuning system, depending on the environment in which he is performing. What makes Ligeti's whole approach different is the fact that he detunes the instrument utilising the computer program, unlike an African musician who would detune an instrument acoustically depending on what s/he perceives to be the desired result.

This detuning mechanism is a distinguishing feature in Ligeti's composition using the Marimba Lumina instrument. Ligeti's fascination with this detuning goes beyond the obvious - he seeks the resultant sound achieved through combining several instruments or sounds tuned differently yet playing at the same time. It is these kinds of innovative systems that composers like Lukas Ligeti have exploited to find new ways of expression in their electronic music. Ligeti has always believed that his being influenced by the sounds of Africa had something to do with his grandmother's interest in African art. His grandmother used to have African sculptures and a CD compilation of African music which she never, however, listened to in great detail. Ligeti received his inspiration from observing the sculptures his grandmother possessed and from listening to African music. He states:

Africa has always fascinated me, and African music has interested me greatly from when I first started composing, but it's very hard to explain exactly why. It may have something to do with my grandmother having collected African art and I was fascinated by these sculptures as a child. Also, I've found African culture easy to get into, people are open-minded and not as afraid of de-contextualization as in many other cultures, and I am, by my family history, a rather rootless person, so de-contextualization comes naturally to me (e-mail correspondence: Saturday, 31 March 2007, 01:45:07).

Performing with the ML allows Ligeti to explore with African forms such as African cycle playing and polyrhythmic patterns. Ligeti uses a great deal of polyrhythmic patterns in the electronic compositions that he performs with the ML. He is very interested in these patterns and since he himself is a percussionist this makes it possible for him to experiment with many diverse rhythmic patterns -it is what drummers do best.

Ligeti has always known exactly what he wanted musically and why he loved to experiment with ‘detuning’ sounds in his electronic compositions. When I asked him in an interview to what extent he detunes sounds in his electronic music and why he uses the detuning element, he replied, “I’m searching for new approaches to melody and harmony. By using unusual tunings, I can find new ways of putting these pitches together, and therefore, new harmonies. I have no fixed method; I detune and tweak sounds until I’m satisfied with what I’m hearing. I don’t really use any fixed ratios or other mathematical or constructionist plans when I detune”. (e-mail correspondence: Thursday, 25 January 2007, 01:07:29)

Sometimes ‘fiddling around’ or experimenting with different sound possibilities that can be achieved with the aid of new technology helps in the discovery of new musical genres and constructs. Lukas often discovers fresh and exciting sounds through just playing around with his computer program in conjunction with the ML. Ligeti is extremely serious about his music in the sense that everything that he does with his music has to have a purpose, whether it is through improvisation or experimentation.

Ligeti explains that most of the detuning process is done by the software inside the computer. He elaborates further that “The detuning is mostly done inside the sound source, not in the ML. So at the moment in my case I do it mainly in ‘*Kontakt*’, which has a feature allowing one to detune a sound on a cent-by-cent basis (100 steps per semitone). I then just move the cursor around and listen. Sometimes I use tunings that don’t contain octaves. I could, for example, say I will divide a major ninth into 8 equal steps; why not? Or I may have no plan at all and just tune sounds individually and see what I come up with.”

When I asked Ligeti what specific software he uses that enables him to detune sound when he is performing with the Marimba Lumina and how it works technically, he answered the following,

I use mainly 2 programs in my Mac⁵: *Native Instruments*, *Kontakt*, a sampler, and *Ableton Live*, a program designed to quickly play back, layer, and manipulate sound files. *Kontakt* is a sampler. I record bits and pieces of sound, either during travels or also out of other computer programs, it could be from anywhere. Then I put them into the computer and call them up -

⁵ Macintosh computer.

either from the computer keyboard or via MIDI from the Marimba Lumina - using *Kontakt*. *Kontakt* also allows cutting, looping, and processing samples in many ways. It's quite a good program, though very user-unfriendly.

Lukas uses African forms to an unlimited extent in his compositions - he never wants to limit himself in his music. He said the following when I asked him to what extent he uses African forms in his compositions and how he uses them:

It is, I guess, less a question of African forms than of African approaches and ways of thinking. For example, it is the notion of having a "relative" beat, that different players or listeners or even limbs of my body can perceive the beat occurring at different points within the music. This concept exists in some forms of African music, for example, the court music of Buganda (as analyzed extensively by Gerhard Kubik). I also frequently use "asymmetric time line pattern" (clave patterns), or base some of my pieces on drum patterns from rhythms like *Gahu* (Ewe neo-traditional music) or *Ziglibethy* (Bete from Cote d'Ivoire). *Mande* music has an extremely strong influence on me melodically. And there are countless other approaches and influences that show up somewhere along the line, but usually in a very informal way and de-contextualized to a certain extent. I do not ask the question of authenticity because I feel these ideas are so strong that they will add to the fabric of the music no matter what the context; they don't necessarily need the traditional environment in order to survive (e-mail correspondence: Sunday, 24 December 2006, 22:21:02)

I believe that the main reason why Ligeti uses a lot of polyrhythmic structures in his electronic compositions is not only because he is passionate about them, but that this is where his compositional approach intersects with his late famous father-composer, Gyorgy Ligeti. When I asked him if he had any specific reason why his music contains so many polyrhythm structures and juxtapositions of rhythmical patterns, he answered,

Very simply, because I'm interested in it. For example, in European music it has been customary to use simultaneous pitches and melodic lines. Together, they form harmonies that are then classified according to relationships they have to one another. In African music, various rhythmic patterns are often overlaid. So I ask myself: how about adopting a 'European' approach to constructing 'harmonic' relationships, but using the 'African' idea of doing it with rhythms? Or how about using multiple tempos, which don't really exist in any tradition as far as I know? I try to form consonances, dissonances, and harmonies out of rhythmic, metric, and temporal simultaneity (e-mail correspondence: Sunday, 24 December 2006, 22:21:02)

According to Manning, technology offers composers much room for tonal flexibility and for experimenting with new sound-worlds. Composers can now play multi-tonal sounds with the aid of computer manipulation, tailoring them to exactly what they want. Modulation was the only way to

play multi-tonal sound at the same time before the manipulation of the computer was possible. Now composers can modulate and play multi-timbre and multi-tonal sounds at the same time with the aid of computers and can detune instruments and sounds in the way they want. Manning goes even further by saying:

“The composer is faced with a particularly difficult task in employing modulation synthesis, for the variables available for manipulation seem very remote from the acoustic phenomena they produce. In the final analysis conventional timbre generation from individual sinusoidal components remains the only technique which allows total flexibility over the production of sounds; the choice ultimately depends on the individual composer” (1985, 225)

Ligeti uses multi-tonal features as one of the musical parameters that he experiments with in his electronic music with the Marimba Lumina instrument. The computer allows Ligeti to do flexible tuning and detuning so that he can manipulate the sound the way he wants, which is why he likes the combination of multi-tonal sounds since there are computer softwares like the one he uses that has the capability of detuning sound in order to achieve his objective of playing multi-tonal and multi-timbered sound.

Ligeti has always had a strong sense of how he wanted to incorporate African forms into his Western music, having previously studied Western classical art music, yet not wanting to sound African nor Western; but desiring to create a new sound world that would blend the two forms in a unique way. He uses African forms as his basis to create a “third plane”; as he says: “I felt that an interesting premise for this voyage would be for me not to attempt to play African music, and not to ask the African musicians to play in a European style, but to construct a “third plane” on which we could meet and interact, exploring the creative possibilities of musical electronics”. The Marimba Lumina plays a central role in this performance (Press release by Lukas Ligeti on The MIT Press 2000 P.41 of 41-47)

The synthesizer was invented with the purpose of discovering new electronic sounds with limitless amount of sonic possibilities. It was through the advent of the synthesizer that the revival of a revolution in the music world took place. Jeff Pressing affirms that

“The synthesizer allows one major theoretical resource to be practically explored in a way no previous performing instrument has: the idea of tuning systems. A tuning system is a system for deciding on the frequencies to be assigned to musical notes. Some instruments can readily play a continuous range of frequencies, like the violin or trombone (*where separate notes are not delineated*), and variable tune each tone, constantly making small variations to give optimal intonation” (1992, 37).

A tuning system is very important in any genre of music because it determines how the music will sound and it also determines what type of audiences will want to listen to the music. Different types of tuning systems allow Lukas Ligeti to explore unknown territories in his electronic music.

Pressing adds that, “When we consider the tuning systems of other cultures, we find a great diversity of possibilities that can be investigated by the synthesizer user” (1992, 41). Pressing goes even further by suggesting the many other tuning system possibilities that could be explored through experimenting with those belonging to other cultures. He even maintains that there is greater means of expression to be found when one ‘borrows’ a form of tuning system from a different culture. A composer like Ligeti embraces these kinds of opportunities and uses them in his electronic music by applying the idea of fusion of African and Western forms of music.

Pressing distinguishes between the two types of tuning systems that he himself differentiates in the musical language. He argues that

“In general, tuning systems are of two types: irregular (or unequal) and regular (or equal). Irregular tuning systems are asymmetrical and therefore produce different sets of pitches from key to key and must be labelled by their tonics; in contrast, regular tuning systems are tuning systems that are equally tempered, have no particular associated key, and produce only one set of chromatic pitches when transposed to a common starting point” (1992, 38).

These two types of tuning systems referred to by Pressing determine the outcome of a musical experience in any performance; that is, whether the sound would be considered dissonance or consonance would depend on the tuning system used. Lukas Ligeti uses irregular tuning systems and therefore he is not governed by any set of rules relating to one tuning system. He is consequently free to use any pitch/es or any sound/s in conjunction with one another and the only criteria would be whether he succeeds in achieving his desired musical and sonic result.

Using technology as an instrumental tool

Katharine Norman maintains that technology could be seen as an instrumental aid or a tool in creating a new music sphere. She says,

“And if technology is aiding the coalescence of several small aesthetic shifts, it might be of instrumental assistance in creating ‘a music’ that is new rather than merely producing new kinds of instruments for the music that we have” (2003, 4).

What Norman is in essence saying is that it is better to use technology as a tool that can produce new kinds of soundworlds rather than introducing new kinds of instruments that would define or produce new kinds of sounds.

I disagree with what Norman says when she maintains that technology itself can be seen as an instrumental tool for new expression - technology itself surely needs the assistance of new instrumental inventions in order to advance musical expression in the form of instrumental sound. In addition to technology introducing new possibilities of sound development it requires new kinds of instruments that can interface with it meaningfully and expand the current electronic status as well as push the envelope of expression much further. Again if technology offers new possibilities of expression through MIDI control and technical support, then the need exists to create new interfaces/instruments in order to merge the world of technological developments together with the world of instrumental advancement and thereby create a completely new genre.

Norman perceives that human artistic evolution is best understood through focusing on the cultural practices of different events in context, in other words our historical and current musical products can be understood through closely listening to the music and through this experience be able to determine the passage and development of time.

While this is valid, I nevertheless maintain that one cannot ignore the fact that electronic music is a genre that is still searching to define itself rather than a music that has acquired its identity through time, like Jazz or Western Classical music. However, it is also noteworthy that technology imitates

historical as well as everyday moments in order to generate new experiences of sound by modifying or creating new expressions of past history.

Since technology alone lacks live embodiment by its very nature, it needs an instrument that would be played by a living individual in order to portray essential body communication during a performance. To elaborate, a computer is pre-programmed to perform a piece of music at a given time with an audience listening; there is a likelihood that an audience may walk away from the performance since it will not have the visual aspect to *see* as well as hear a performance – the listeners see only a person pushing buttons and hear sounds generated only by a computer. In a situation with a live instrumental performer one has the experience of being part of the performance and responding to special moments in the performance as an immediate reaction to a ‘living’ music.

An impression would be made by the performer’s body expression and movements. Since an instrument shows an individual’s inner feelings through body motion and body language, these could be lost if an instrument were not involved. No one is disputing the fact that listening to electronic music alone is valuable for changing one’s musical perceptions of that form - it is also important to note that listening contributes to an understanding of post-electronic music in order to interpret what the composer is trying to communicate through his/her music. However, I maintain that it is also very important to make use of new kinds of interfaces/instruments together with technology in order to find completely new means of musical expression.

Ligeti’s music is a very good example, therefore, of a kind of music that has adopted a different approach in post-electronic music through connecting the use of a computer plus a unique instrument (The ML) and pre-recorded sound samples. Ligeti’s music therefore supports the notion that it is crucial to maintain the kinetic energy that is passed to the audiences by the performer during a performance. The ML is a perfect electronic instrument that interfaces with the computer and demonstrates the importance of having a live performer in an electronic performance environment.

Although Norman maintains that it is better to create ‘new’ music with ‘new’ technology rather than creating ‘new’ kinds of instruments that would give meaning to the term ‘new music’, it is well to remember that new kinds of instruments are capable of creating the kinds of tones and sounds that the

computer alone cannot. It is in the articulation and production of different kinds of acoustic sounds that a whole new dimension is brought into the music.

Norman argues that “As a precision tool, technology can be instrumental in expressing the presence and depth of structures inside sound” (2003, 3). Although it is true that technology has the power to present structures of sound formation yet there is no justification for replacing the performer with technology just to prove that technology can also do what a performer can do - the performer will perform with emotions and feelings, which the computer cannot do.

Norman uses Cage as an example of a performer who used instruments to create new kinds of sounds rather than one who depended on technology to create new sound-worlds for himself. She says “Cage was careful to avoid the words ‘electrical *musical* instruments’, and indeed distanced his credo from a concern with inventing new interfaces for playing old music” (Norman 2003, 3). Cage believed that sound-worlds could only be recorded and manipulated through the computer, meaning that they could only come to life when performed with different moods and expression.

Lukas Ligeti prides himself on making music that he likes and this is what constantly motivates him. When I asked him to explain what he is trying to achieve through the technology he applies as well as the African influences and other elements borrowed from other styles of music he said,

I am trying to make music that I like and make music that is somehow original, that hasn't been done before; trying to find new ways of expression, trying to, for example, find new ways of perceiving rhythm and harmony; it's just like research that is probably never done that I am continuing as much as I can- I am trying to also make a living. It's a very general philosophical question that is very hard for me to answer. But I am trying to do things that musically are new and that satisfy my art taste (Interview with Lukas at Wits University on Monday 25 August 2006).

Ligeti believes that he has achieved much of what he has tried to do from the very beginning regarding his music. He says that,

I think I have primarily achieved a fairly personal unusual voice, also with electronics, it's not technologically necessary to know sophisticated signal processing; a lot of people do a lot of signal processing. I try to achieve what I do with simple means and try to stay focused on the artistic aspect not so much on the psychological aspect. Technology is not just a tool for me because getting into technology I also gain more artistic ideas as well, so I don't want to

underestimate that avenue at all. My home base is music and trying to do with technology things that could not be done without technology is very important for me. (Interview with Lukas at Wits University on Monday 25 August 2006).

Lukas Ligeti has worked very hard to get to where he is today with the Marimba Lumina because he didn't have much rehearsal time on the instrument before his first performance at the Unyazi festival. I asked him about the challenges and problems that he faced when he first started playing the instrument. I also asked him to explain to me what the advantages and disadvantages were and even the difficulties involved after making the choice to play the ML. He replied with the following:-

I started playing the ML only about a month before playing at Unyazi. I worked like crazy during that month, though, also because I'm a drum set player and not a mallet player really, so I had a lot to learn. Some of the music I played at Unyazi was composed specifically for the ML while other pieces were essentially ported from the Drum Kat, a controller that I played before and which is programmed very differently. Porting these pieces turned out to be challenging and time-consuming, because the two instruments are conceived very differently. For example, the Drum Kat has only 10 keys, but I can assign a different stack of up to 128 midi note numbers to each key, and then cycle through the stack. The ML has only, I think, 6 stacks available at a time; these can then be 'linked' to any of the keys, and these stacks only take 24 midi note numbers each. So in that sense the ML is much weaker than the Kat, however if I use one stack per key, I still have 18 unused keys on the ML that I can do other things with, so in that sense again it is stronger (e-mail correspondence: Thursday, 25 January 2007, 01:07:29).

Ligeti does not consider his music to be minimalist nor avant-garde as some might think. Though some people think his music is minimalistic, he explains that the most important feature of his music is the element of fun. He tries to make sure that his electronic music is not too serious but always includes a light-hearted aspect. He explains that

The way my music is structured it does not have that much to do with minimalism-the way the minimalists work is that there is a certain structure and it gets repeated, and at some point it changes. In my music the changes happen in a much more gradual way and there is not that much repetition. Things are very layered and musical events don't happen at the same time. I am not a minimalist composer. (Interview with Lukas at Wits University on Monday 25 August 2006).

Lukas uses multiple tempos in his music. He says that he is a very playful composer:

I like playing around with things. I don't like limiting myself to a minimal amount of material, which is what the minimalist composers do. That is also why I am at odds with a lot of avant-garde people because avant-garde people have a very redemptionist attitude, but I am not a redemptionist at all. I like playing, and sometimes that is why people don't take me seriously. I am trying to make my music sound like fun (Interview with Lukas at Wits University on Monday 25 August 2006).

In a nutshell, technology has definite capabilities yet it lacks human energy if it is used alone *sans* the performer. African forms have influenced and shaped Ligeti's electronic music. Technological advancements allow flexible tuning and detuning, which has always fascinated Ligeti with regard to his music. Technology needs an instrumental support rather than being an instrument in itself, since it cannot do what an instrument can do and it cannot replace a human being in terms of visual vitality and performance.

Chapter 4

Improvising with sound samples

This chapter will address the importance of improvising as a musical technique with special reference to the Marimba Lumina and how the element of improvisation integrates with the use of pre-recorded sound samples. Improvisation has a component of freeness and it allows one to do new kinds of things each time, which is exactly what Lukas Ligeti wants in his music.

My sounds are mostly samples – sonic snapshots made during my numerous travels, often in Africa; they range from recordings of traditional instruments to various types of soundscapes. I like melodies and am equally influenced by traditional music, contemporary composition, and electronica/techno. If you believe you are hearing effects boxes, such as delays or loops, I don't use any. I do use some onboard effects in my computer, but mainly you are hearing effects that I've 'pre-composed', by editing my sample using looping and layering techniques. Except for a few short melodic playbacks, what you hear is what I actually play. This is a combination of composition and improvisation, but includes no speculation (Program Notes from a performance at the Wits University Johannesburg August 2006).

Looking at these introductory notes by Lukas about the work, '8 or Infinity' that he performed at the Atrium, Wits University in August 2006, one can already establish an element that sets him apart from others in his music; this is the use of pre-recorded samples used in the performances of his compositions. Reading the notes above one can see why this kind of innovative work requires a new approach – one that is entirely appropriate with the shape and nature of music that is played on the Marimba Lumina. The use of samples together with the ML clearly distinguishes Ligeti's approach from that of laptop musicians.

Music in the twentieth century frequently drew on environmental sounds reflecting natural sounds which were not instrumentally produced. Katharine Norman in her book entitled *Sounding Art* takes different forms of sound formations and explores how these can be understood under the umbrella of electronic music. She states, "A music made from the sounds of the world can instigate a transcendent, composed listening that re-encounters the familiar as something wonderful. Frogs and saucepans

continue - oblivious listening in the ‘medium’ that is composed and it is the listener who is transformed” (Norman 2004, 55).

Improvisation is an element that draws from different cultural influences and musical tastes – it relies on individual preferences and the material one listened to while growing up. Derek Bailey uses the term ‘free improvisation’ to unpack the difference between avant-garde music and experimental music. He says “freely improvised music is an activity which encompasses too many different attitudes to music, too many different concepts of what improvisation is, even, for it all to be subsumed under one name”(1992, 83). Lukas Ligeti was brought up in an environment where he was musically classically trained and also considering the fact that his father was a renowned composer of the avant garde, makes him a very interesting composer whose upbringing was enriched with a great variety of different musical styles. One of the interesting aspects about Lukas is that he grew up with influences from Africa by listening to African music, which dates back to his childhood: “I grew up listening to African music over quite a long period of time; my grandmother used to have a collection of African music” (e-mail correspondence: Saturday, 31 March 2007, 01:45:07). Ligeti uses a myriad of African rhythms in his electronic compositions, which include: interlocking rhythms, cycles of pattern repeats as well as poly-rhythms found in his improvised music.

Although Ligeti uses a computer as the main tool for performing his electronic compositions together with the Marimba Lumina, he uses the ML to improvise in his actual compositions. Improvising using the computer as a controller the way Ligeti does, may pose a question that, according to Schwartz, can be answered in three ways by using three categories. He says the so-called ‘computer music’ can be seen and understood in three categories; on the one hand, he says

“when people speak of ‘computer music’, they may, in fact, be referring to any one of three totally different kinds of operations: (1) the use of the computer to control various settings of synthesizer modules, (2) music actually composed by the computer itself, or (3) the computer used for ‘performance’ of preconceived ideas, generating information that can be transformed into sound” (1973, 87).

I want to focus on the last two categories referred to by Schwartz. The reason for this is because Lukas as a composer and performer utilises the second and third categories in his works. Schwartz argues that there is a misconception about the music actually being composed by the computer itself. However, composers who use the computer as an adjunct to compose or for performance purposes have a

specific musical intention, and wish to have full control over their music. Schwartz also points out that in the third category of computer music, the computer is seen as, or functions as a performer *and* a controller but not as a composing instrument. Lukas's rationale for using the Marimba Lumina is that it reads data from the computer in order to produce sound. In his case the computer is seen as a controller and a performer since it outputs data to each Marimba metal, so that when he beats it, it produces a specific sound and a specific timbre and tone.

Ligeti goes beyond the idea of using only a computer as an improvisation tool by including the Marimba Lumina as an extra device to expand his improvisational vocabulary in his electronic performances. In his case, as Schwartz argues, Ligeti is not using the computer as a performer because he performs for himself, but he is rather using the computer as a controller to organize the pre-recorded loops that he obtains from different places.

According to Griffiths, when a performer is improvising, there is a shared moment between the audience and the performer, which means that when the audience is observing the performer's movements, they interpret them as a means of communication between themselves and the performer. This highlights the importance of the 'collaboration' of the computer with an instrument to effect a holistic narrative.

Griffiths further maintains that "Audiences can be brought into closer contact when there is some shared framework of discourse and indeed the survival of improvisation (and, like almost everything in music since 1945, it has survived) appears to have depended on the evolution of attunements within ensembles and between ensembles and audiences" (Griffiths 1995, 205).

According to Eric Clarke and Jane Davidson, it is very crucial to *see* a musician performing because there is a close contact between the musician and the audience. This is similar to what Griffiths says when referring to an improvisation-type performance. They emphasise that dynamic movements signal a reaction in the audiences as an intrinsic part of the communication. They argue that "[in] any musical tradition in which improvisation plays a significant role it is far more obvious that the dynamics of movement may strongly influence (even at times determine) the sonic outcome" (Clarke and Davidson 1998, 89).

The sentiments of these three authors link in to what Ligeti himself says about the concept of not neglecting the deliberate use of an instrument in a live performance. This allows the audience to be an active participant in the performance and to experience the music on an emotional level.

Ligeti has his own opinion about what experimental improvisation means to him; he says,

According to me experimental music is music where you are trying to do something and have some kind of an idea and trying it out and seeing what happens. Experimental music is making music without having an attitude. Often I try to challenge myself by trying to do something where I am not sure what is going to happen. In improvising, I sometimes like to take risks as well. I try to do a lot of experimentation at home and try it out in a performance and see if it works. It's like working in a science lab in which you try to mix some chemicals and see if it will explode (e-mail correspondence: Thursday, 28 December 2006, 08:17:00)

Lukas considers the electronic music that he performs with the Marimba Lumina to be purely experimental and improvisational while keeping the music as technologically based as he can. To a question I posed regarding the kind of music he composes and performs with the Marimba Lumina, he replied, "Hard question ...maybe I can say more when in Vienna. In short words, I'd call it experimental, melodic, polymetric and kaleidoscopic music based on sampling technology" (e-mail correspondence: Monday, 20 November 2006, 03:31:44). Improvisation for Ligeti is something that offers him a sense of openness in his music; he uses improvisation as a means to find new ways of expression in his electronic music. Improvisation has also motivated and inspired Lukas to record sound samples from different places and environments and he tries to re-use the sample in different ways by doing something that is completely different from what the sample initially was. He records samples that fascinate and interest him at any time that he hears something good or imagines that the material can be developed with other kinds of material that he collects.

I asked him to explain if there was any particular reason why he records and collects specific samples from different places or if it has something to do with his mood at a particular time. I also wanted to discover if there are locations that are better than others to record in or if he only records sounds that can usefully be remixed. "I guess I search around" he said, "and at some point I come up with something. In some cases the sounds get used immediately, and sometimes I just think they're good but have no immediate use for them and will put them aside, and come back to them by integrating them

into a piece later on or start a new piece based on them” (e-mail correspondence: Monday, 20 November 2006, 03:31:44).

Emmerson (2000, 12) postulates that the production of sound is multi-factorial; different elements go towards creating sounds in everyday life, whether natural, physical or synthetic sounds, for example, a sound created by hitting an object with another object. Electroacoustic music is theorised as a combination of a definite pitched (musical) sound (which according to classical convention is an instrumental sound) with indefinite sound, which in this case can be called “noise”, to produce a combined electronic and acoustic sound. This theory of electroacoustic music focuses on sounds of the world and musical sounds in a manner controlled and manipulated through a computer, but not always. For instance, the sound of a motorbike can be manipulated through musical software in the computer in order to get a pleasing electronic sound, which is then combined with the sound of an instrument, or alternatively used alone. Both Norman and Emmerson emphasize the use of natural sounds as a fundamental element encompassed by electronic music within its genre.

The use of pre-recorded samples by Ligeti in his compositions are precisely what Emmerson and Norman talk about, namely, the way Ligeti records sounds in the outside world and plays them together with composed material and performs them as one coherent organism.

Ligeti does not refer to the samples he pre-records as ‘loops’ because he does not use them as loops; in fact he does not even loop them in the music program that he uses together with the ML. He calls them samples because he assigns these samples to each Marimba Lumina metal so that depending on what metals he beats at a time the sound would be different each time. He explains:

I really don't use pre-recorded loops per se, in that I don't use a looper when I play live. I do prefabricate some pre-recorded accompaniments, but they rarely repeat and therefore can't really be considered loops. Rather, they are simply very long samples created by pasting together several shorter samples. These are triggered by MIDI just like anything else, and are part of the whole, really not to be dissociated from the rest. I also use very few effects and create things that sound like delays, etc. just by layering samples by triggering them myself; for example, several times in short succession. I don't use many loops because I want to really "play" the music; I want to be able to intervene at any point and be flexible rather than just starting things and then going on autopilot (e-mail correspondence: Thursday, 28 December 2006, 08:17:00)

‘Improvising’ as Bailey points out is a technique or a skill that often develops when one is playing with a group. The improvising materials are collected in bulk and put at the back of one’s mind for performance preparation; these are referred to as a vocabulary of improvising materials. He says that solo improvisers also use the same technique of collective vocabulary materials when improvising. Bailey says, “In the choice and development of material the solo improviser works in similar ways to the group improviser, building a personal vocabulary and working to extend it in both performance and preparation”(1970, 106). The same applies to Ligeti when he improvises on his ML; he has collective materials of musical elements that he rehearsed beforehand and tries to remember how he can use them coherently in a live performance. He collects different sound samples from different environments and he then uses those samples together with some of his compositions when he is performing with the Marimba Lumina in order to create an improvisation of a different kind.

Ligeti then prepares the sounds before he performs. This means that he has more or less an idea of the outcome of the sound that he wants to create in a performance, though most of it would be dependent on the improvisation technique he applies when performing. When he performs with the ML he performs alone. He tries to apply and incorporate the techniques and skills he possesses as a percussionist. When Lukas plays the ML he imagines that he is playing the drum Kat patterns – this produces a most unusual and unique effect. He incorporates different African features in his performances, for example poly-meters, poly-rhythms, polytonalities, melodies, micro-tonalities and cyclical patterns. The kind of improvisation technique he uses is the so-called “personal vocabulary” that Bailey speaks about.

I refer to his improvisation technique as “personal vocabulary” because he first assigns the sound samples to each metal bar before he performs on it, though sometime he changes the bars during the performance, which enables him to assign each sound to a separate bar of the ML and plays each sound separately, yet achieves an organic coherent sound. This is the approach that Bailey refers to that an improviser has to rehearse and memorize before the performance.

Bailey continues his argument by stating that, “Improvisation is the simultaneous design and execution of musical ideas. The devising and performance of the invented material are “synchronous” or, more

realistically, occur without substantive introspection in a fraction of a second, improvisations are either free or, more typically, used a referent. The referent is an underlying scheme or guiding image specific to the given piece” (1992, 23). Improvisation therefore, according to Bailey, can be seen as a mode of freeing the musical ideas which lead to discovering new things about the music itself since improvisation embodies the element of chance.

Electronic music offers new insights into the improvisation arena since it can generate a limitless amount of sound possibilities. When considering improvisation from an electronic point of view, one needs take into account the fact that electronic music itself is still trying to define itself in a post – electronic world. Bailey points out the fact that ”it is clear that electronic music is still in a stage of exploration and that electronic music composers, when they do not imitate traditional styles, are still grappling with the formation of an authentic language (or authentic languages)” (Bailey 1992, 25)

Bailey explores the idea of the improvising of electronic music employing the synthesizer as the core instrument, since the discovery of the synthesizer prompted many composers and performers to view it as an indispensable device in experimentation live performances. Bailey disputes the fact that the improvisation aspect of electronic music also depends on the style of the music; he says “typically, the style in which the synthesizer is played will determine the amount of improvisation appropriate: Jazz-like solos will feature improvisation; pieces in classical style will have fixed arrangements of notes; popular song solos may be improvised, newly composed, or slavishly copied from a previously recorded studio version, depending on the band” (Bailey 1992, 24)

Jeff Pressing states that to have new kinds of musical experiences musicians need to move away from the tired old sounds and try to discover new ones. He breaks new ground by suggesting that post-electronic composers can make a fresh contribution by re-using old material in a new stylized manner. Pressing says that “New sounds often come from a study of the limitations of old sounds” (1992, 301). He believes that the secret in realizing new sounds lies in the study and evaluation of the old sounds- this means that composers should always reference from the old music (or the old sound formation) in order to discover new kinds of sound possibilities.

Lukas Ligeti listens to a great variety of different styles of music in order to reflect on his own musical style. He does not consider his music to be random, although there is much improvisation in his music. I asked him to explain what the difference is between his music and that of contemporary laptop musicians, in terms of the way they use the MIDI interface. He replied:

It's hard for me to comment on other musicians, as it's always hard to know how they work. Electronics is such an individualized field. With Electronics, it's possible in principle to just press one key and then the computer starts and does the rest automatically. I try to actually play much of the music in real time, and also think very melodically. This might lead one to believe that I try to just replace a 'normal' instrument with electronics, which by the way is something many people do. But that is not the case with me. I try to only do with electronics what can't be done with normal instruments; for example, creating certain weird phrases and saving and recalling them, changing tunings gradually over time, and playing extremely complex metric relationships.

When referring to other musicians, he says:

Many musicians do heavy sound processing; I do less of that but actually build the processing into the samples, often with very low-tech means. Also I use very little looping. My main wish is to always be able to change the music on the spot, to have much spontaneous impact on what I'm doing live, within the constraints of a certain piece or choice of available sounds, and to know exactly what will happen when I do a certain thing...there is very little randomness in my music, although there is much improvisation. (e-mail correspondence: Saturday, 31 March 2007, 01:45:07).

I asked Lukas to elaborate on how he uses the pre-recorded samples in the Marimba Lumina and to explain the technique he uses to assign each sound sample to each metal bar of the ML. "The samples are in my computer", he explained. "Each metal (actually, they're coils, but in analogy with a marimba, probably best to call them keys) is programmable with a variety of parameters. For example, I can assign a certain sample to a certain MIDI note number and channel in the computer. If I then programme the ML key to that same note number and channel, the corresponding sample will be triggered in the computer every time I hit said key on the ML" (e-mail correspondence: Thursday, 25 January 2007, 01:07:29)

Lukas uses a wise approach in unifying and simplifying his improvisation technique on the ML. His choice of computer programmes while improvising and interfacing the ML with the computer, are carefully considered. We can look at a musical programme, in this scenario, as a tool that makes the

communication between the instrument and the music editing application come alive. Ligeti uses a specific software called Ableton Live, which he considers very brilliant in allowing him achieve his objective. When I asked him how the software works and how he applies it , he explained:

Ableton Live (you can find out more about it at www.ableton.com) is a program made for the fast, spontaneous manipulation of sound files. You can load a sound file into it and then it will play it back, cycling through it again and again. The good thing about the program is that you can then do this with many sound files simultaneously and very quickly and easily manipulate them - change lengths, etc., as well as process them through all kinds of very good effects that are also part of the programme. And the programme has a very good onscreen interface which allows you to keep a good overview with what you're doing. It is a good compositional tool, but even better for improvisation because it handles so easily and quickly.

He referred to his usage of the software in practise:

I use it in my solo program but actually use it much more in my band, Burkina Electric, a dance 'electronica' band from Burkina Faso, where we have set songs but improvise a lot with them when we play live. In my solo music, I use *Native Instruments* and *Kontakt* more than *Live*. *Kontakt* is a sophisticated sample playback system made especially for MIDI control. It provides very good sample editing possibilities and a good interface for using with MIDI controllers, but does not have the capability of letting one edit and manipulate things as easily as does *Live* (e-mail correspondence: Thursday, 05 April 2007, 21:08:28)

To summarise, it has become clear that improvisation in the context of Ligeti's performances with the Marimba Lumina, that he really does not want his music to be too serious, but it is a means to enjoy his passion and have fun. This is his way of positioning post-electronic music improvisation in a very unique way. Improvisation plays a significant role in presenting an interaction between the performer and the audience, which, according to Ligeti, is a good way of passing the kinetic energy from the performer to the audience. It is also a good way to keep the momentum of the performance alive. Improvisation opens a myriad of ways to freedom of expression and it offers virtually limitless room for experimentation in music.

Chapter 5

Analysis

In general terms, when it comes to interpreting any composer's work it requires one to be insightful about the composer's intention and what s/he is trying to achieve and what s/he is trying to express. According to Robert Stecker there are many principles involved when interpreting a piece of music. He says, "When we interpret works of art and literature we are seeking to understand or to appreciate them or to improve on our current level of understanding or appreciation. We do this by attempting to discover or, at least, ascribe on *some* basis, a meaning in or to the work in question or to determine what significance the work has for us"(2003, 29). Stecker emphasises that it is very important to understand the composer's intention before interpreting any art work; furthermore one should also study the composer's life and biographical details in order to have deeper insights and appreciation of what the composer is trying to convey with the work of art. Interpreting Lukas Ligeti's piece should be easy because Ligeti always has a clear understanding of what he is doing with his music and the direction it takes; it is not something that just happens by chance. A consistent factor found in his music is that he frequently displays an African influence in his music; this means that many musical parameters that he explores in his electronic music are African forms which he integrates into his Western music.

An analysis follows of one of the pieces that Ligeti performed at the *Unyazi* Festival in 2005 called "8 or Infinity". The reason why I chose to use this piece is because it is very different from the other works that he performed at the Festival. Ligeti called it "8 or Infinity" because he used to programme his music on an old MIDI controller that had eight channels: 'Infinity', because the piece could theoretically last up to several thousands of years, which seems pretty infinite.

To understand and analyse this piece I would need to examine African music practice as well as Western music practice. Ligeti is interested in exploring "polymeters, polyrhythms, melodies, micro tonality and as diverse an array of sounds and sound colours as possible".

In order not to limit himself in his music, he explores different kinds of soundworlds to find new ways of expression for his electronic music. He wants his music to be playful at all times. When I asked him why he uses certain musical elements, he said, "Because I'm playful and don't feel the need to limit myself to certain soundworlds just because they are fashionable or "politically correct". (e-mail correspondence: Thursday, 25 May 2007, 02:13:23).

"This piece is different from the others in that it is more oriented toward sound and less toward rhythm. It's more atmospheric, more for conjuring up a certain feeling, and is in some ways almost more of a sound installation than a composition in the usual sense" (e-mail correspondence: Wednesday, 18 April 2007, 21:43)

An interesting aspect about this piece is that he detuned sound to achieve multi tonalities. At the beginning, he uses various sine waves which he detuned micro-tonally. The way the sounds are organised in this piece produces distortion but at the same time maintains the detuned resonances to build the sonority of the entire piece. Ligeti has experimented a great deal with the detuning element in this piece as a method of achieving diverse moods and feelings in the music since it is more 'sound'-oriented rather than 'rhythm'-orientated. The sine tones overlap and cause various types of beating rhythms. When played loudly, they tend to overload the p.a. system, which adds "dirt" to the beating rhythms because of the distortion. These sounds then give way to similarly detuned violin samples, recordings of Lukas' friend, the great violinist Mari Kimura. Similar beating rhythms result here, but they're not as obvious due to the overtone spectrum of the sound and the fact that the samples of Mari are quite short. A cluster effect of sorts is created by them, however.

When one listens closely to a piece of this nature, the natural questions arise as to where the melody, rhythm, meter, pitch and other parameters can be located. A piece like this does not have a structure that uses music parameters as its basis. It utilises pure sound to define its structure, which means that it can best be understood in relation to the way the sound is structured and the resulting texture. The absence of music's normal building blocks and shape of this alternative musical architecture shows that it is an innovative work requiring a new kind of interface. In referring to the musicians and others that influenced him in the composing of this piece, he relates the following:

On top of that, I superimpose recordings of singers I worked with in Egypt in 1999 - I did a project there with Nubian musicians. The violin clusters mixed with the Nubian calls create, for

me, a feeling of a large space and of distance, loneliness. Then, some percussive samples come in. These are mainly me banging on the wall of an office building in Austria where I did a site-specific dance piece, also in 1999. Also, I use voices of the dancers trying to sing. After that, I introduce sounds from various sources...some African traditional recordings, guitars and balaphones, and also sounds taken from a recording session I did in Austria with my friend Rupert Huber, who is a member of the well-known Electronica Duo *Tosca*. He was trying to play the guitar and we recorded, and nothing was ever done with the recording, so I used it in this piece. From there, I go to samples of another friend of mine from Austria, Benno Sterzer, playing some kind of African flute - though I'm not sure what this instrument is exactly, plus Nubian percussionists also recorded when I was in Egypt.

In the case of many of these sounds, especially various guitars and Benno's flutes, Lukas explains that he edited the samples by introducing extremely short loops. "If you make loops that are only a millisecond or so long, but let the sampler cycle in these loops for a long time, you get a sound that no longer resembles the original sample, because the loop is so short; instead, there is the sound of a tone, a pitch, which can be tuned by changing the loop length".

He uses this technique frequently. By constructing such loops of different frequencies, and by introducing these loops at different points during the samples, he can create strange melodies which will play with unusual rhythms. In this electronic piece, he uses all these techniques in a very improvisational manner. He just sets up some fairly complex and multifaceted sound environments; one could call them small sonic scenes or scenarios, and tries to explore them in a different way every time he plays the piece. "It is definitely the most improvised piece I played in my Unyazi set".

The main feature, therefore, of this piece is detuned sounds and sustained sounds that overlap each other. Ligeti used these three main elements because he wants to focus on the sound arrangement rather than rhythm. This piece is also structured in a 'pull and push' force, by this I mean when the one sound is pulling to dominate the other sounds in the piece those other sounds hold back from overpowering this 'pulling' sound. The music starts with one sustained sound-block that slowly builds up with increasing tension till the other sounds start coming in. A noteworthy feature, one that dominates this piece is a continuum of sustained sound impacts on the work with ground- braking power. The texture begins with one sound and builds up into a thick cluster of sound.

Because of the nature of this work it can be perceived as a 'sound installation'. The resonances 'compete' with one another and overlap. There is no sense of a melody at all, sometimes the music occurs in a "call and response" format. There are violin and voice loops that come in every now and

again in the piece as it proceeds. Some of the loops sound like noise which is being superimposed on other sounds. The detuned sound of people singing over other existing textures makes it very difficult to hear what they are saying.

The detuned voices add to the ambiguity of the texture and they overlap each other frequently. This piece is unique also because it uses unusual resonances and makes coherent meaning out of these sounds by juxtaposing and overlapping them. As the piece moves forward towards the end, it reverts to the opening atmosphere or theme or to reinforce the primary soundscape of the music.

To summarise: this piece is definitive of innovative work since it requires a new kind of interface/instrument. Lukas Ligeti has shown through his electronic music how important it is in the so called “post-electronic music” era not to get stuck in the comfort zone of using only a laptop for performing but rather to have a live performer that can transmit the expression and emotion of the music through body language, live sounds and expressions.

Conclusion

Innovative work in electronic and electro-acoustic music requires new kinds of interfaces and instrumental applications. The era of an audience being ‘treated’ to a spectrum of other-worldly sounds and resonances by a knob-twiddling laptop musician where the “visual” aspect is the back of a computer, is now past. Ligeti’s innovative work engages in a practice of exploring new kinds of experimental sonic spaces and new kinds of expressive journeys through technology and its symbiotic adjuncts. Post electronic culture demands new technological interfaces and instruments to catapult music into a new phase of creative exploration. Innovative in this context presupposes the courage to engage in the culture of technological experimentation without social or conceptual limits or limitations imposed by musical style. It has been said that in the twentieth century the only limitation to breaking previous creative boundaries is the depth and size of the composer’s musical imagination itself.

Lukas Ligeti has taken electronic music to a new space and time –he has ‘pushed the envelope’ not only within technological development, but also in conceiving of new “partnerships” between technology and electronic musical instruments. He has taken a marimba, an instrument associated with the percussion section of an orchestra or an indigenous African musical instrument, and through its ‘digitalisation’ coupled with his vast imagination, created a new genre of twenty-first century music – the living synthesis of advanced technology and human virtuosic endeavour. The Marimba Lumina in the hands of a brilliant percussionist-composer like Ligeti now forms part of a specialised Ensemble incorporating the *live* element into performances of new music with pure technology. This is a testament to the heights that can be reached by the genius of the human spirit - the realisation of man’s limitless imagination and achievements in the world of technology.

With this marriage of *Man, Machine and Marimba* Ligeti has attained new heights of expressive content, new textures and timbres and a new visual aural spectacle in a most appropriate post - electronic music practice. This is taking place during a technological ‘revolution’ and in an era when composers are searching desperately for new modes of musical expression and new musical material and languages. There is an imperative for composers to keep abreast of technological developments or be left behind in the race for originality and innovation. Technology is continually in a state of

developmental flux as systems are refined and brand new mechanisms, apparatuses and interfaces are demanded. Ligeti's electronic music was born at a time when technology was already in a very advanced state. His music comes to life with these new avenues of possibility and the combination of his virtuosity, creative genius and technological application produces music of a very advanced level.

Ligeti uses and exploits MIDI as a primary communication tool to interface the Marimba Lumina with the laptop in his electronic performances. He took this 'leap-of faith' in an era when electronic composers were still focusing exclusively on the laptop only as the performance vehicle. What makes his application even more unique is that he not only incorporated a new performing instrument but also introduced a different approach to performing by using pre-recorded samples from the environment. His music has a fresh sound since it combines MIDI materials that he himself pre-composes as well as pre-recorded sound samples - he mixes and controls them via the computer while simultaneously performing on the Marimba Lumina. He assigns each sound sample to a different metal bar of the ML so as to produce a completely new sound each time the same work is played. Lukas Ligeti's contribution to contemporary music practice is profound and its value will be judged in time to come.

BIBLIOGRAPHY

- Appleton, Jon H and Perera Ronald C (eds). 1975. *The Development and Practice of Electronic Music*. United States of America: Prentice-Hall, Inc.
- Bailey, Derek. 1992. *Improvisation: Its nature and Practice in Music*. London: British Library National Sound Archive
- Benjamin, Walter. 1968. 'The Work of Art in the Age of Mechanical Reproduction' in Harry Zohn, (tr.) (1969), *Illuminations*, New York: Schocken.
- Boom, Michael. 1987. *Music through MIDI*, United states, United states of America.
- Brindle, S, R. 1970. *Contemporary Percussion*, New York: Oxford University Press
- Chadabe, Joel. 1997. *Electric Sound: The Past and Promise of Electronic Music*, Englewood Cliffs, NJ: Prentice Hall.
- Clarke, E. and Davidson, J. 1998. 'The Body in Performance' in Wyndham Thomas (ed.), *Composition -performance-Reception*, Aldershot, UK: Ashgate.
- Deutsch, A. Herbert. 1976. *Synthesis: an introduction to the history, theory & practice of Electronic Music*. United States of America: Alfred Publishing Co., Inc.
- Emmerson, Simon. 2000. *Music, Electronic Media and Culture*. England Hampshire: Ashgate.
- Griffiths, Paul. 1995. *Modern Music and After*. New York: Oxford University Press.
- Holsinger, Erik. 1994. *How music and Computers Work*, United States of America. Ziff-Davis Press.
- Jonathan, Dunsby and Arnold, Whittall. 1988. *Music Analysis: in Theory and Practice*. London. Faber.
- Lochhead, Judy and Auner, Joseph (ed.). 2002. *Postmodern Music Postmodern Thought*. London: Routledge
- Manning, Peter. 1985. *Electronic & Computer Music*. United States. Oxford University Press.
- Norman, Katharine. 2004. *Sounding Art*. England Hampshire: Ashgate.

- Pierce, John. 1999. 'Hearing in Time and Space' in Perry R, Cook (ed.), *Music, Cognition, and Computerized Sound: An Introduction to Psychoacoustics*, Boston, MA MIT Press, pp. 89-103
- Pressing, Jeff. 1992. *Synthesizer Performance and Real – Time Techniques*, United States of America: Oxford University Press
- Roads, Curtis. 1985. *Composers and the computer*. United States of America: William Kaufmann, Inc.
- Rona, Jeffrey. 1994. *The MIDI Companion*, United State of America: Oxford University Press
- Selfridge-Field, Eleanor. 1997. *Beyond MIDI, The Handbook of Musical Codes*. United States of America: The Cambridge MIT Press
- Schwartz, Elliott. 1973. *Electronic Music*. London: Praeger Inc.
- Smalley, Denis. 1992. *The listening imagination: listening in the electroacoustic era*, in Paynter, John; Howell, Tim; Orton, Richard; Seymour, Peter (eds), *Companion to contemporary musical thought*, pp. 514-54, London: Routledge.
- Stecker, Robert. 2003. *Interpretation and Construction*. London: Blackwell Publishing Ltd.
- Storr, Anthony. 1993. *Music and the Mind*, New York: Ballantine.

Web references

Note: All other web references are cited within the text.

Lukas Ligeti. 2000. *Beta Foly, Experiment with Tradition and Technology in West Africa*. 27 September 2006. The MIT Press P.41 of 41-47

(<http://www.jstor.org/view/09611215/ap050010/05a00120/0?frame=noframe&userID=928d0fdf@wits.ac.za/01cce4403500501e0c1ca&dpi=3&config=jstor>)

Mirjana Veselinović-Hofman. 2005 "<http://www.newsound.org.yu/27/texts/mirjunya27.html>" accessed on January 25, 2007

Mirjana Veselinović-Hofman, 2005 "UNYAZI": ELECTRONIC MUSIC SYMPOSIUM + FESTIVAL 2005 (Johannesburg, University of the Witwatersrand: Wits School of Arts, 1–4 September)

Matthew Ostrowski: <http://www.slought.org/press/11326/>) accessed on March 13 2007
<http://nathanielstern.com/ITP/unyazi-2005.html> January 25, 2007

Articles

Peter Kirn: article name "Creating digital music" (<http://createdigitalmusic.com/2005/04/11/p5-data-glove-and-music/>) accessed on the 24 March 2007

SOURCES

Interview with Lukas Ligeti on Monday 25 August 2006.

Audio recordings made during this interview.

Live performances on the Marimba Lumina from the Unyazi festival, 2005

Appendix

Interviews with Lukas Ligeti

Evans - How would you say the difference between your music that you play with the ML comparing to other electronic musicians of your time, in terms of the way you use MIDI interface?

Lukas Ligeti - It's hard for me to comment on other musicians, as it's always hard to know how they work...electronics is such an individualized field. With electronics, it's possible in principle to just press one key and then the computers starts and does the rest automatically. I try to actually play much of the music in real time, and also think very melodically. This might lead one to believe that I try to just replace a "normal" instrument with the electronics, which by the way is something many people do. But that

Is not the case with me, and I try to only do with electronics what can't be done with normal instruments, for example creating certain weird phrases and saving and recalling them, changing tunings gradually over time, and playing extremely complex metric relationships. Many musicians do heavy sound processing; I do less of that but actually build the processing into the samples, often with very low-tech means. Also I use very little looping. My main wish is to always be able to change the music on the spot, to have very much spontaneous impact on what I'm doing live, within the constraints of a certain piece or choice of available sounds, and to know quite exactly what will happen when I do a certain thing...there is very little randomness in my music, although there is much improvisation.

Evans - LL I am quite impressed by your approach to musical practice considering the fact that you are a composer/performer who is Western trained and being interested in African form. What really makes LL to be the LL that we all know and what makes him unique if we may say, please elaborate?

Lukas Ligeti - I'm very flattered by your comment but don't really know what to say. Certainly I listen to much music that is little known, and using these obscure influences helps me arrive, for better or worse, at a style that could be called original. Another aspect is that, due to having the father I've had, I

in some way grew up very close to contemporary music and am therefore maybe less star-struck or respectful of it than many other people. I believe that there is much in contemporary music that is actually like the emperor's new clothes, with people not understanding what is going on, and being ashamed to admit this to their colleagues. So then they create a philosophical, mystical aura around it, and discuss it as a highly intellectual matter, just to conceal that they don't understand a thing, and then whole cliques engage in this kind of discourse, and a culture of pseudo-intellectualism is created through a collective inferiority complex. I refuse to participate in this, and actually think a lot of music is hard to understand because there really isn't anything in it to be understood; in other words, I see the nakedness of the emperor. This problem is especially severe in Europe, Germany being the worst. Africa has always fascinated me, and African music has interested me greatly from when I first started composing, but it's very hard to explain exactly why. It may have something to do with my grandmother having collected African art and I was fascinated by these sculptures as a child. Also, I've found African culture easy to get into, people are open-minded and not as afraid of de-contextualization as in many other cultures, and I am, by my family history, a rather rootless person, so de-contextualization comes naturally to me. When it comes down to it, every person is very complex and so to describe what makes me be me would fill a book...as it would for you as well.

Evans - I always see you as a very inspiring figure to young electronic composers/experimental electronic composers. What message can you send to young electronic/experimental composers who are willing to adventure fully into experimental electronic music?

Lukas Ligeti - Well, first of all, I'm still (hopefully) a young composer myself. The life of a musician is very unpredictable and you have to be ready for that...it demands lots of sacrifices, because it's a very time-consuming job and pays little. The only reward is doing something you are truly interested in. If you really want to do this and nothing else, you should do it. If it's a toss-up, maybe you should do whatever the other thing is, because you'll probably have a more comfortable life! That's all I can say. I think it all has much less to do with talent for music or programming specifically. Being a good composer has more to do with the ability to be original and think out of the box, though of course a good knowledge of craft is a big plus. I also should add that I don't only do electronic music. I also work just as much as a composer (and player) of acoustic music. Not being a full-time electronician probably makes me a bit less sophisticated in certain technical aspects that someone who does only

this - but on the other hand, it prevents me from becoming too technical and losing touch with the musician's side of it.

Evans - The element of using the pre-recorded samples in your music makes you a very unique musician. Could you explain why you chose to use pre-recorded samples or sound-worlds rather than perhaps taking other sound sources for example?

Lukas Ligeti - I like using my own sounds because I find building sounds to be an integral part of creating electronic music, and because it seems somehow more honest to me. Also, sounds I make myself seem to fit my music best; after all, I make these sounds with a certain musical result already in mind. But this is not to say that I don't occasionally pillage sound libraries and CDs – I do, and am very much in favour of the permission to sample other people's music freely. In fact, some of the most interesting electronic music

for me has been made by people using other people's CDs as source materials...I mean, for example, the works of John Oswald, Carl Stone, Oval, or Yasunao Tone (I've put Dimitri in touch with John Oswald and hope he will be at the next Tladi festival as will Stone). In my case, I don't for the most part use very long pre-recorded tracks; in any case I try more and more to avoid using them as playbacks. Though again, I sometimes do this; I just use my taste as a guiding force and have no exact principles or methods. I'm

not sure how unique this is. Many sound artists use self-recorded soundscapes. I guess the difference is that I'm more a composer than a sound artist, meaning that I think in terms of melody, harmony, rhythm, and form, as well as timbre, whereas sound artists tend to focus almost exclusively on timbral/atmospheric matters and are not so concerned with form as their music is often meant to have more the effect of an installation than that of a concert piece.

Evans - LL you spoke about software called Native instrument contact during the time I was interviewing you at Wits. Would you mind explaining to me how you use the software and what role does it play in your musical practice? Please elaborate.

Lukas Ligeti - It is a sampler. I record bits and pieces of sound, either during travels or also out of other computer programs, could be from anywhere. Then, I put them into the computer and call

them up - either from the computer keyboard or via midi from the Marimba Lumina - using Kontakt. Kontakt also allows cutting, looping, and processing samples in many ways. It's quite a good program, though very user-unfriendly. Look at www.native-instruments.com and find Kontakt there.

Evans - What kind of Sequencers do you use and what do you use them for? Could you also explain how you use them and how do they interact with the ML?

Lukas Ligeti - I use a very old version of Logic Audio but will update soon. I sometimes use it to compose, but also for some limited playback during live gigs, and use the sequencer's midi functions to interact live with it, sending messages to effects, program changes, muting or un-muting tracks and so forth.

Evans - How would you describe the music you compose and perform it with the Marimba Lumina?

Lukas Ligeti - "Hard question ...maybe I can say more when in Vienna. In short words, I'd call it experimental, melodic, polymetric, kaleidoscopic music based on sampling technology".

Evans - These Pre-Recorded loops of sounds do you have a specific reasons why you recorded the once you have recorded or it is something that you just do when you feel like you have heard something that you can use or remix in your own way?

Lukas Ligeti - "I guess I search around and at some point I come up with something. In some cases the sounds get used immediately, and sometimes I just think they're good but have no immediate use for them and will put them aside, and come back to them by integrating them into a piece later on or starting a new piece based on them".