Embracing a Mediat[is]ed Modernity: An Approach to Exploring Humanity in Posthuman Music

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In the nineteenth century, the reputation of Beethoven's music persisted long after his death, causing younger composers to feel as if they were competing against the "flood" of Beethoven's influence. Many composers like Johannes Brahms and Gustav Mahler reconciled themselves in this situation by referring to or adapting materials of Beethoven's but using them in their own ways.[1] The advent of recording technology extended this effect to every composer that could be recorded, without relying solely on history to recognise and preserve their voices through repeated performances. The voices of performers are also prolonged through recorded media. Now every sound can live forever in this sense, and new artists are caught amidst the ever-growing flood of once-living artists.

The industrial revolution further short-circuited space-time: recordable media and radio allowed technology to replace the need for physical presence in concert halls and personal meeting places. This trend has escalated over the past century, even allowing recorded media to be accessible from a pocket-sized device and personal communications to take more widely varied forms. In the twenty-first century, modern communications systems have short-circuited humanity. Posthuman agents are gradually removing human agency and identity from the picture. Technology like instant messaging, social network websites, and virtual reality environments sever the human connection in communication and [2] technology for audio and video transmission replaces the audience, forcing a fixed perspective on the events witnessed.

In musical composition , synthesisers and samplers have replaced the voices of humans or natural instruments played by humans, and compositional agency is increasingly bestowed upon posthuman agents. Software programs for composition by mechanistic looping, copying and pasting, or algorithmic intelligence are

becoming more accessible and pervasive. The traditional kinds of art we see and hear are increasingly the products of technology, and human fingerprints on those works are fading from view. In this light, Beethoven and Louis Armstrong are no longer people, they are commodities or brands. As technology fulfils the tasks humans used to do, the human elements in our communications and art are eroding away.

In response to this, many artists have expressed themselves through their adaptation of the work of other artists. Andy Warhol famously co-opted the art of commerce, while in music, John Oswald's "plunderphonic" recordings are composed entirely of well-known previously recorded songs by other artists. [3] This tendency is mimicked in contemporary youth culture in which personal websites, ring tones, and shared link streams patch together a unique identity for the user entirely from "readymade" materials.

Some artists have taken another approach. Perhaps because it appears impossible to be a truly unique individual in today's world, or perhaps to minimise the risk of failure as such, some artists have shifted to focus on creating identities instead of directly creating art works—a "diversified portfolio" of identities. Electronica artist Uwe Schmidt has many different public personae, each with his or her own specific style of composition and presentation. Schmidt's body of work is not directly the music but really a set of identities that each produce their own bodies of work. In this case, Schmidt carries out every action in the name of each persona. He need not be concerned about the creative originality of the final output, however, because his creations are the composers themselves, like Señor Coconut, who released an album of Kraftwerk covers performed by his conjunto band with intentionally low-budget graphics and packaging. [4] As Schmidt sees his work, 'I invent "the image." I create like a fake world…a fake character' (Hollings, 2002: 27, discussed in Hofer, 2006: 316).

Technology and Transformation

One might say communications technology replaces each of us with a "fake character" through its position of mediation between humans. The intervention of communications technology in the path between sender (performer or composer) and recipient (audience) is a kind of mediation by technology, and it is rarely transparent. The term *mediatise* was first used to describe the annexation of one nation by another, in which the leader of the annexed nation maintains his or her title and occasionally some authority, [5] but more recently, Jean Baudrillard has adopted the term to discuss the transformation of events when they are recorded or transmitted by communications technology. [6] He originally meant it to highlight more overt or intentional kinds of transformation of the symbols in play, but it has come to be used by others in a more general way highlighting any result of the process of recording or transmitting once-live events. [7] In this article, *mediation* refers to the intervening position of technology, and *mediatization* refers to the effects of that intervention (in the general way without Baudrillard's embedded implications).

It is interesting, however, to reconsider the original definition of mediatisation. It already contains senses of both emasculation and preserved identity In all senses of the word, the mediatised object becomes a reference to the original but loses its authenticity. In the mediatisation of live events through technology, what is lost is the *aura* as Walter Benjamin described it, the sense of authenticity that comes from witnessing the "real thing," whether it be the original *Mona Lisa* or an unmediated live performance. [8] Through mediatisation, "real" live events become *hyperreal* (after Baudrillard): they enter an artificial world in which once-live moments are frozen in unrealistically extreme detail and are susceptible to endless manipulation by technology but still carry the reference to the authentic once-live event.

Modern audiences have become accustomed to granting the same authenticity to mediatised objects as the realities they symbolise. Philip Auslander has carefully argued that contemporary society has become desensitised to the differences between live and recorded media, and so, at the level of the audience, they are wholly equivalent. Alternatively, Peggy Phelan insists on recognizing the difference

between the live and the mediated:

> Performance cannot be saved, recorded, documented, or otherwise participate in the circulation of representations of representations: once it does so, it becomes something other than performance… To the degree that performance attempts to enter the economy of reproduction it betrays and lessens the promise of its own ontology. Performance's being… becomes itself through disappearance (Phelan, 1993: 146).

Phelan points out that something is lost when a performance is reproduced and that the loss weakens its ontology, but is it the state of the performance or that of the recording that is affected? In Benjamin's terms, the aura of a work is lost through reproduction, so the copies are degraded, but the original is unaffected by the existence of the copies. However, Phelan refers to the ontological promise of the original performance. To 'enter the economy of reproduction' is to do something that is *reproducible*, whether or not it is reproduced. The more that *would* be lost through reproduction, the more substantial it is, or the greater its aura. [9]

When a sound is recorded, the sample does not keep the aura of the original sound, but in the context of live sampling within the course of a musical performance, the sample can gain its own aura that reframes the original as an acoustic version of a musical idea later presented in an electronically-mediated form. Phelan writes that the sample 'can be performed again, but this repetition itself marks it as "different". The document of a performance then is only to spur a memory, an encouragement of memory to become present' (Phelan, 1993: 147). The sample that is a copy of an event earlier within *the same* live performance in which it is played back, however, must lie somewhere between the often-sampled "Amen break" [10] and the return of a fugue subject: it is both the artificial reproduction of another musical event and the recurrence, prolongation, or imitation of musical material within a work. Live sampling during performance is like musique concrète come to life: it still concrete (in the sense of freezing sounds in recorded form), but it uses the "Now" as its subject. Live sampling facilitates structural phenomena, not just extramusical or intermusical

(intertextual) signifiers. Not only does the aura of the original moment slip away, but the memory of that aura is replaced with a new one situated in a net of imitative references. Multiple copies of the musical idea, acoustic and electronic, can reframe each other as particular references to an abstract musical form evoked by—but lying outside—the performed music. The original event becomes merely the earliest reference to a musical idea within the performance. In the works presented below, the sonic presence of the performer is prolonged and folded upon itself in time, taking along the (hearing) gaze of the audience, to be continually revised.

To explore this kind of structure, I developed live sampling instruments controlled by a gamepad or Nintendo Wii Remote and have used them in performance with improvising musicians. I begin each performance with no preloaded sounds; my sonic materials come only from the other instruments during the current performance. The process of exploring the live-sampled sound can become part of the developmental structure of the live performance. The once-live can become live again when it is replayed, but it becomes a new and distinct event happening in its own moment: Now. It connects with (and escalates by that reference) the moment in which the referent was first performed. Live sampling within an improvised performance intensifies the connections made in this way, because the performers are not reading from a musical score. What they play cannot be reproduced in another performance. Even in composed works, I am working primarily with structuring improvised passages in order to magnify the sense of liveness and intensify the significance when those Nows are mediatised and manipulated. Replayed material can participate in and influence new Nows and be recontextualised within the new web of connections.

Through such a performance, cause and effect can become twisted or reversed: the authenticity of being the "real" musical idea can be passed among different iterations of it (for example, a theme followed by variations or a climax preceded by foreshadowing copies), it can be cast outside the musical work to refer to a series of events that never actually happens within the performance, or authenticity can be completely demolished. My goal is not simply to deconstruct the concept of

authenticity and celebrate its demise but instead to use the establishment, distortion, and reinforcement of authenticity as a new way to create and manipulate tension. The elements that are lost through the mediation of technology expose new elements that are unique to the live performance, and this mediation itself can be included in the performance in the form of live audiovisual sampling to build imitative contrapuntal textures that explore the area between liveness and mediatisation.

Stage Presence

Before exploring compositional approaches, let us consider how the nature of live performance and musical instruments has also changed as technology has advanced. In a pervasively mediatised culture, live performance is often seen as a flawed substitute for recorded media. As Benjamin predicted, the aura of liveness and the Now may become foreign, worthless, or imperceptible to an audience. [11] Phelan says 'the now is supplemented and buttressed by the documenting camera, the video archive', because it is becoming rare in our current culture to experience live performance unmediated (Phelan, 1993: 147). However, even when there is an audience watching attentively, many performances involving electronics do not offer them much visually. The fairly new possibility of using a laptop computer as a performer's primary or sole instrument has raised tension over stage presence. When the performer on stage looks the same while doing office work, playing a video game, or giving a masterful musical performance, hunched over behind a computer display, an audience may become as detached from the musical experience as the performer appears to be.

The increased use of technology in live performance has evoked varied responses. Some are troubled by the apparent disparity between performative acts and the sounds resulting from them. Others give it no thought, having become accustomed to valuing only the sound, because that is all most recorded music delivers. Perhaps a new performance practice is developing with different values, or perhaps the troubling qualities of this disparity can help us reflect on our understanding of the value of live performance. In my experience performing with computers, watching

others do so, and speaking with audience members about it, I have observed that it is generally disconcerting to watch straight-faced pointing and clicking and perhaps even more troubling to watch repetitive jerking with a control interface if there is no visual clue regarding the musical results of those actions. While Julio d'Escrivan believes that younger audiences are increasingly less troubled by such disparity and that this will soon cease to be an issue, [12] two things have become clear to me: audiences can be sensitive to the relationships between performative causes and effects, and because of that, it is possible to exploit liveness as a distinct element of a work of art.

Outside universities, many developments in electronic music involve using guitar effects pedals. The pedal format is convenient for a guitarist to switch effects on or off while standing (allowing for good stage presence) and keeping both hands busy. However, it is becoming more common to have electronics performers seated on the floor hovering over a collection of pedals, ignoring and hiding from the audience. This can be related to Phelan's 'economy of reproduction', and it can also illuminate the performative shortcomings of the automated components of laptop music. A scripted or automated process is usually a product of the composer or instrument builder; the contribution of the performer is reduced to nothing but pressing buttons to trigger events or changes in ongoing events. While a script is reproducible created for the purpose of repeatable automation, the resulting physical movement is minimal at best, and because it only contributes something that is easily reproduced, it adds no substance to the ontology of the performance. This brings to mind a derogatory reference to unmusical instrumentalists as being merely "button pushers". It is "unperformerly" and it can alienate an audience.

Over the time I have performed with electronics, I have experimented with mannered actions, taking after dramatic pianists that lunge their torso into chords and raise their hands high above the keyboard before or after playing a run. I understand (as many pianists insist) that some of these motions have real effects on the sound, but I maintain that they are mostly superficial exaggerations and that the sonic effect is usually minimal. However, the overall effect of the performance may indeed be

strengthened by such visual ornaments. In performance, I began to allow my face to reflect the intensity or fulfilment with which I meant to imbue my performance. I used higher than necessary hand strokes to push buttons or sliders, which let me feel more in control of timing, like a conductor's preparatory gesture. When expressively changing playback speed with a gamepad-controlled sampler in order to approach a climactic note attack, I began to let the gamepad tilt back and forth accordingly. By acting as if I were playing a "real" instrument, it seems to have helped audiences process the fact that I actually was.

Causal Performance

There can be an intriguing counterpoint between causal performance and its effects. By *causal performance* I mean any action of a performer during a performance that has some result in the performance, either generating a sound directly or triggering events or changes in the action of the software program. These actions can be ornamented or mannered. Other actions may be purely ornamental, having no effect outside themselves. It appears to be helpful for the performer to act as a surrogate or model for the audience in this way, demonstrating the emotional intensity, physiological engagement, sincerity of expression and enjoyment of the performance that a sensitive audience member might experience. It can be frustrating, confusing, or insulting to the audience if such signs are not present or congruent with the musical content of the performance.

I have seen this alienation in effect even among contemporary art specialists and musicians, for example after a performance at the International Society for Improvised Music conference, in which Eric km Clark performed on electric violin and I performed with him using a computer to mediate his signal. The sound heard through the single instrument amplifier did not always include the live violin signal. Sometimes the live violin playing only caused past violin passages to be heard, and at other times there was no obvious relationship at all between Clark's actions and the sounds and silences coming from the amplifier. One observer, who was also performing at the conference, expressed discomfort with this performance: 'If there's

a violin there, I want to hear it', and other performers separately made similar remarks. Members of my audience that came looking for meaningful relationships in only the usual places (e.g., pitch or rhythm) tended to see the overt mediation by the computer as a mistake or malfunction that only obstructed their experience of the performance. A more Cagean mindset, ready to appreciate anything for what it is, would more readily notice and appreciate the tension and release in the counterpoint between the live events and the resulting sounds (whether or not they were intentional).

These experiences with superficial gestures congruent with the sounds heard and with intentional incongruities between performance and sound do not represent rigorous scientific research, and I would not use them to make claims applying to every performance situation. However, they have made it clear to me that the effects of mediation at play in these performances are indeed salient. Audiences have detected relationships between the live and the mediatised and responded positively or negatively to them. The live and the mediatised are not collapsed into one, as Auslander claims. They are only overlooked as a result of recent social conditioning, much like the way audiences have become accustomed to tuning out coughs or other incidental noise in a live audience. The relationship between the live and the mediated can establish and release tension and therefore can be used as a new dimension for structure and expression in performance. The examples that follow show how I have applied and explored this concept in my own artistic works.

Example Works: Zur Elektrodynamik bewegter Musiker *(2005)*

In my works the computer's live sampling capability is used to exploit the effects of communications technology on the authenticity of live performance as aural and visual extensions of the classic musical technique of imitative counterpoint. In musical composition, *counterpoint* refers to the interactions between two or more musical entities (e.g., instruments, melodic lines, etc.) that are independent but presented simultaneously. In any given parameter of the performance, e.g., pitch, rhythm or loudness, entities may be similar, contrary, or indifferent to each other at

any time. This contrapuntal interplay can yield textures that are complex yet compelling. In music, *imitation* refers to building up contrapuntal textures by having some entities mimic others, shifted in time so that each remains independent. A simple example is a round or canon, in which the same tune is sung by multiple people, with each singer beginning at a different time. Imitative counterpoint is a fascinating way to create music that is tightly woven from limited original materials, yielding works that are organic and coherent.

Imitation has been used as a structural device throughout history since the middle ages, but it has historically been a tool best suited for composers working outside real time. Improvised music has been important in many cultures, including today's performers of jazz and free improvisation, but composition-like structures have been difficult to achieve in extemporaneous performance. As computers have become powerful enough to run processes in real time, computerised instruments and computer-aided composition tools have entered the realm of live performance to bring new structures to improvised music.

Zur Elektrodynamik bewegter Musiker is a software performance environment in which a solo human performer improvises, and the software records the performer and shapes the input into new textures and gestures and contributes to the formal structure of the work (by making decisions regarding what sonic elements and modes of behaviour to bring back at any time). [13] It is form (created, or rather set in motion by the composer) independent of content (contributed by the performer). Like a hall of mirrors in darkness, its form and structure exist on their own but are only revealed when a performer introduces material with which to illuminate it. It is imitative counterpoint, but not in a way that can be composed on paper or conceived out of real time. While *Elektrodynamik* exists only as a software program and does not contain explicit instructions for realizing particular sounds like a traditional compositional score, it is still a musical composition.

Inspired by mid-century musical developments, Umberto Eco wrote that such an "open" work of art 'gains its aesthetic validity precisely in proportion to the number of

different perspectives from which it can be viewed and understood. These give it a wealth of different resonances and echoes without impairing its original essence' (Eco, 1989: 3). Like other open works, every performance of *Elektrodynamik* exhibits certain qualities that are characteristic of the specific work and are resultant from the structure of its program. In this case, the act of composition includes designing algorithms to bring about certain behavioural and musical tendencies, and the object of the composition, the "work", exists in every performance. I describe my approach to be like sculpting randomness. The work is not built by arranging its surface particle by particle but instead by taking an unknown set of "would be" results and paring away possible outcomes until the shape of the remainder fits my design. Any randomised decisions resulting from my final product will support and outline the overall form and structure of my design. This can be seen as an additional dimension of the musical work; whereas traditionally notated two-dimensional sheet music compositions can be performed with an arguably infinite set of variations, compositions like this involve performance as an additional dimension of itself. While a traditional composition is interpreted in performance, these compositions are instantiated.

In the improvisatory nature of the work, some compositional agency is given to the performer, like many works since the middle of the twentieth century. Through the algorithm-driven decision making during performance, some compositional agency is also bestowed upon the software program; it too is a composer-performer in this work. Together, the program and the human performer can realise an infinite number of unique performances, and because it has taken the role that was once only for humans to full, the software is a posthuman agent. I, the (first) composer, did not compose any note of any performance of the work. Instead, I created the *system* that does so. Like Uwe Schmidt's Señor Coconut, *Elektrodynamik* is an agent capable of producing its own oeuvre, and *Elektrodynamik* itself is part of mine. This agent of structure, used in a special way described below, can even be made to allow the voice of that system to emerge from its mute structure.

Tappatappatappa: Elektrodynamik *as its Own Input*

One approach taken by sound artists to reconcile their humanity with the machinehood of their tools is to use these tools as artistic instruments themselves, sometimes short-circuiting them in complex feedback loops. (The practice of circuit bending is another example.)   In performances of *Tappatappatappa*, a 2-inch speaker cone is used like a dynamic microphone, providing input to the program that is the composition *Elektrodynamik*. The cone is excited by stroking or tapping with fingers, a pipe brush, and a frayed wire, but it also picks up sounds in the room, allowing the software to sample its own output and establish feedback resonances. These resonances and the overall sound quality of the recaptured input can be shaped by moving the handheld speaker, pointing it in another direction, covering it, or damping it with a finger, which mutes it, as one would silence a cymbal. The implements used to excite the cone do not need to be rich in timbrel possibilities. They provide enough timbrel variety to influence the output of the system in a general way and allow precise temporal control to create rhythmic gestures and textures as needed for the system to build upon or to allow solo intervention in the performance.

The resulting resonances are particular to the orientation of the surfaces, speakers, performer, and audience within the space. This adds an exploratory element to performance, unique to each situation and developing within each performance. After performing a while in one environment, the memory of each position and angle associated with a certain resonant response can become like a tactile sensation for the performer. Multiple delays with shifting properties and auto-mixing features constantly change the system's response, adding to the improvisational aspect of the performance.

These systems sonify the process of computation instead of merely displaying the result of it. When used in a feedback system, creations like this can be treated like distinct instruments: computation instruments. This echoes a sentiment in Stephen Wolfram's study of cellular automata, highlighting the beauty of computation not for the purpose of an end result, but for the sake of computation—that is, for the

artefacts of the process itself.[14] Before Wolfram, many have mused at the beauty resulting from natural processes like the formation of crystals, erosion of rock, or the growth of plants, and Benoît Mandelbrot made a connection between these natural processes and simple iterative mathematical processes. [15] Cellular automata as explored by Wolfram exemplify such processes that can yield complex and beautiful results from simple rules. Each automaton is given the same set of rules that determine its state (usually binary) based on the states of the automata in the previous generation. While these can be used to find a particular end result (a solution), the structure of that process can also be appreciated. For Wolfram, this is the value of computation for the sake of computation; it is an approach more common to structures formed in nature. For example, it is more common for one to appreciate the overall form of a coastline (or its evolution over time) than to use data to determine the position of one point on a coastline. In nature, process can be appreciated as artistic. In most art, the nature of the creation process may be appreciated, but the resulting product is the object of value. In computing, the result is a solution to a problem, and the process is usually neglected, except to see if the result could be reached faster. However, this need not be so.

Wolfram attempts to explain the artistic value in some natural or computational structures with his principle of computational equivalence: 'almost all processes that are not obviously simple can be viewed as computations of equivalent sophistication' (Wolfram, 2002: 716–17). He continues to suggest that some processes are perceived to be complex or beautiful because the processes are as sophisticated as the humans perceiving them. At that critical point, it becomes 'easy to forget that the rules are really in place,' as Gary Flake put it (1998: 11) while discussing computation and beauty. Perhaps this explains why it is difficult to prescribe processes based on simple steps (like computer programs) that are capable of beautiful results. It can at least be gained from Wolfram's methodical study that chaotic systems can be instrumental in achieving beauty in computerised processes.

With feedback instruments like *Tappatappatappa*, the chaotic system of room acoustics is explored during performance. While the feedback instruments I have

created all involve streaming speaker-to-microphone feedback, the results of each system are distinct, because the programs are distinct. Feedback illuminates the natural resonances of the acoustic system as well as the software system. The voice of the system (the posthuman agent) emerges as the original stimulus (the human element) erodes.

The experience of these developments has led me to believe that embracing chaotic elements will enable electronic tools to mature in their own right and become as robust in application and deep in sensation as acoustic instruments. Non-linearity in acoustic instruments gives them their character, detail, and natural sound. While these principles are increasingly well understood, some aspects still may only be approached through experimentation and experience. Whereas in acoustic instruments the challenge is to bring order to naturally chaotic systems, with electronic instruments, in order to achieve the same level of depth, we must find approaches to bringing chaotic elements to the excessive order of the digital computer.

Performative Counterpoint

Let us return to *Elektrodynamik* to explore another intriguing property of it. One special performance of *Elektrodynamik* (with soloist, not feedback) demonstrated how the parameters of musical performance are not purely sonic. As musicians play, they also move. This motion is not always parallel to the music heard, but it is always related. These motions—the fingers on the instrument, the body as it leans inward—provide contrapuntal gestures that are often ignored. By playing on the tension arising from awkward stage presence in technology-based performances, a new dimension of musical structure can be developed for expressive use: it is the dimension of liveness and mediation, which requires live performance in order to be meaningful. Liveness itself can be used and manipulated as a distinct musical element.

Elektrodynamik was originally created for cellist Ulrich Maiß to perform with a

standard acoustic cello. However, in a performance at Texas A&M University on October 2, 2007, he used an electric cello, which made (practically) no audible acoustic sound. Its electric signal was sampled, manipulated, and re-presented by the program, but the originally performed sounds could only be seen, not heard. Conversely, the sound could be heard only in heavily-mediatised form, with no visual component to their being triggered. This effectively served to slice the performance away from the music as a distinct element in the overall work.

Unlike the lifeless laptop performances described above, however, the nature of the program established a counterpoint between the sight of causes and the sounds of their effects. The program is created to have each track of sound, or voice, play only when the performer plays, play only when the performer is silent, play and stop in the same rhythm as the performer but shifted in time, or play in full without regard to the performer. At times all active voices may be responding in the same way; at other times there will be a mixture of behaviours. With a silent performer, there were times in the performance when Maiß made a clear playing gesture and at that same time, sounds were heard—and they were sounds that once came from him—but they were not the sounds that he was playing at the time. At other times, performed gestures would be accompanied by silence or cause a change in balance among the sounding computerised voices. This changing and varied interplay of relationships, from direct congruence to direct opposition and everything in between, established a flow of tension and release in the dimension of liveness and mediation. The performance itself was contributing to the music and extending it into the realm of intermedia art by integrating and elevating the performative element instead of simply being performable sound art.

In interactive musical works like the ones presented here, William Seaman describes a new challenge to the artist:

> The artist need no longer seek to define a singular artefact, but instead need develop systems that enable a series of sonic artefacts to become operational and polycombinational, thus engendering an emergent relational sonic artefact

during exploration (Seaman, 1999: 234).

In these works, I have attempted to step outside the system of traditional compositional techniques (and the assumptions that go with it) and instead to use the *system* as the medium for artistic expression. As a result human identity is found less in the creation of single acts than in the creation of systems, each act of which is part of the *character* designed or discovered by the human creator. So, while the medium is largely posthuman in performance, the human element is manifest in the whole of all its performances. In the difference between the live and the mediated, as has been demonstrated above, a new dimension of tension/resolution and structure can be developed in a way that can only be meaningful in live performance.

NOTES

[1] Bonds, 1996.

[2] Baudrillard, 1987.

[3] Oswald, 1985.

[4] Hofer, 2006.

[5] Oxford English Dictionary, 1989: s.v. *mediatize*. 'More generally: to reduce (something) in power or effect by interposing a mediating agent.'

[6] Baudrillard, 1994; 1981: 175–6.

[7] Auslander, 2008: 5.

[8] Benjamin, 1969; 1936.

[9] Auslander attempts to decry Phelan's claims about the importance of the ontology

of performance in a few ways, but none affect the relevance of Phelan's points to my thesis. He argues that some of Phelan's example works of performance art are 'contaminated' by their inclusion of pre-recorded materials as if there were a political antagonism between pro-liveness and pro-mediation camps (Auslander, 2008: 45–8). This irrelevant in my work, because I am not using pre-recorded material coming from outside the live performance but live samples in the case of which the audience has experienced both the original and the copies within the same sitting for the purpose of highlighting the differences between them. Auslander also extends Phelan's value placed on the constant disappearance of live performance to the medium of video presented in scan lines, in which a video frame is never completely presented before the next frame starts appearing (*ibid.*: 48–9). This however, operates at a level beyond our perception, in order to present the illusion of a stable image to the eyes and brains of the audience. When Phelan discusses disappearance, she is addressing the preciousness of performed events directly perceivable by the audience, working on a different level of time and perception. In general, Auslander's work tries to shift authenticity to the published and distributed recording and its specific nature within rock culture (*ibid.*: 96). In contrast, some of the works I describe here lose their meaning when fixed on recordable media—does this mean that the works and performances do not exist, at least in any appreciable way? I continue with the assumption that they and Phelan's ideas are not made irrelevant by Auslander's genre-specific discussion.

[10] The Winstons, 1969.

[11] Benjamin, 1936: 224.

[12] d'Escriván, 2006: 183–191.

[13] The title is adapted from Einstein, 1905, in honour of the centenary of its publication.

[14] Wolfram, 2002.

[15] Mandelbrot, 1982.

[16] The title is from Borges, 1964; 1946: 187.

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Sound Examples

Zur Elektrodynamik bewegter Musiker performed by Eric km Clark, violin at the Atlantic Center for the Arts (ACA) in New Smyrna Beach, Florida, July 3, 2006, http://www.ourmedia.org/node/248632

Tappatappatappa performed by Jeffrey M. Morris during the Bellingham Electronic Arts Festival at the American Museum of Radio and Electricity in Bellingham, Washington, November 20, 2006, http://www.ourmedia.org/node/297632

Motet (another improvisational software performance environment) performed by Eric km Clark, violin, at the ACA, July 3, 2006, http://www.ourmedia.org/node/250744

Motet with feedback performed by Jeffrey M. Morris at Texas A&M University, April 27, 2007, http://www.ourmedia.org/node/313638

Improvised performance by Jeffrey M. Morris, Nintendo Wii Remote sampler, Eric km Clark, violin, and Anna Graciela Arenas, video processing at the International Society for Improvised Music conference at Northwestern University, Evanston, Illinois, USA, December 14, 2007, http://ourmedia.org/node/374223

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