

LIVE NOTATION: ACOUSTIC RESONANCE?

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ABSTRACT

The present paper acts as a viewpoint shared by two authors; a live coder who uses their programming language in live music, and a live artist who uses their body in live fine art. We provide background to these practices, before entering a dialogue exploring their confluence. The subject of the dialogue is a hypothetical collaborative performance, from which a shared platform of *live notation* could be explored. The relation between code and body is confronted from both perspectives, looking for a role for live notation as an intrinsic part of live work, both for body and code. In this we consider notation as not being something that precedes, defines or is created by a performance, but as activity that resonates within a performance.

1. INTRODUCTION

The present paper is a confluence of two performance arts, finding a viewpoint for a live artist and live coder to reflect upon their practice, and look for means of collaboration.

There is some existing context for this work, for example Nick Collins has applied the principles of live coding to dance, working with choreographer Tessa Prima, and separately with Matthew Yee-King as *Wrong-Headed* [1]. Similarly, some fine artists have worked with public performance and programming in the construction of multimedia and performed work, such as Simon Biggs in *Body Text* (2010), working with dancer Sue Hawksley and sound artist Gareth Paine. However, we hope the present discussion marks a new point of departure.

The practice of live art is neither choreography nor dance, but rather fine art in the temporal embodiment of live action. Accordingly, the present exchange between live coder and live artist takes the form of a philosophical rather than technological engagement. We take this as a step towards a performance collaboration, where the present paper focuses on the step rather than the destination.

Before beginning our dialogue, we provide context for it, by introducing live coding and live art in comparative terms.

1.1. Live Coding

It may seem that live coding is now well enough known to the computer music community to need little introduction. However, in truth the nature and purpose of live coding is

still not well established even by its practitioners. It involves computation, but surprisingly not even that is well defined; we have great understanding of halting Turing machines, but the computer systems we use and interact with are rather different [2]. For our present purposes we take the stereotypical live coding performance as implicit; a programmer on stage, writing code to make music, with their computer taking on changes to the code on-the-fly. Importantly, the code is projected for an audience, exposing the activity of programming, the code acting as the programmer's metaphorical voice. The *live* in live coding is often taken in this sense, of a live performance before an audience. However, it is important to note an alternative broader usage has always been present, which is concerned with any live interaction, even in a solitary composition process [12]. At its heart, live coding is concrete action through abstract code, perceived in the present moment.

The emergence of live coding has taken the computer music community by surprise [3]. Perhaps this is because on the surface, live coding is somewhat at odds with the computer music community's overriding concern with sound as multidimensional timbre. It might seem that the focus on code brings us back to that which Wishart refers to as lattice-based music [13], being represented and constrained by discrete symbols. For braindance, techno and other step-sequencer oriented musics, the affordances of code may feel completely natural. For electroacoustic musics, performing with live code may feel less natural, simply because discrete structures of code do not map as well to amorphous music. Of course there are many contemporary and historical musics which overtly include both discrete and continuous texture in balance, most presently the growing *dubstep* family of genres, for which the affordances of code give us only limited reach.¹ Indeed, we are sympathetic to the view that human perception necessarily involves both continuous imagery and discrete symbology [9].

Live coding is still in the ascendancy, with new languages and approaches continually developed, shared and performed with. In support, the present conference has established expert live coding review panels for both music and papers, and the Computer Music Journal (CMJ) recently published a DVD of videos featuring twenty two "second generation" live coding practitioners, with a spe-

¹Although note the work of MCLD (<http://mclld.co.uk/>) in integrating live coding and beatboxing, particularly his performances with the algostep artist Kiti le Step.

cial issue to follow. So why live coding, and why now? One explanation could simply be that there is a generational wave of computer music researchers who enjoy beat-driven techno and electronica, and find live coding to be a promising line of research for this domain. Furthermore they may see such musics as a natural target for computer music research; while Patcher software [10] is based on analogue synthesisers, and Digital Audio Workstation software is based on analogue tape machines, the 16 step sequencer and tracker interfaces which gave birth to acid house music are at base digital interfaces for discrete time structures. Using programming languages to process discrete patterns allows a computational, full-stack musical lattice, from functional or procedural composition to discrete events.

Live coding could also be seen as a counter-movement against once radical but now traditional approaches in the broader computer art field. For example, the notion of generative art, as popularised by Brian Eno, is often defined in terms of autonomy [4]. But to focus on autonomy is to ignore the relationship between the programmer and their work, and therefore ignore the programmer altogether. Live coding counters this by exposing a running program as a component of the activity of programming, and therefore as human activity rather than disembodied autonomy. By projecting their screens, live coders could be making the point that “this is not what software is doing, this is what we programmers are doing”.

All this brings us to a troubled sentence; live coding provides a *linguistic* interface which affords a musical *lattice*. The trouble is that language does not only exist within a discrete alphabet, but also as it is articulated by being spoken, written or signed. Natural language has dual existence as both a sequence of discrete words, and a continuous spoken prosody. When listening to speech, we need not choose which we appreciate, as we can experience both at the same time, intertwined, in mutual support [9]. As a result, by exposing the code work in live performance, we stumble upon an intriguing opportunity to expand our notion of source code into the continuous domain. Making steps towards this, we connect the notion of code work with body work, by opening a dialogue between live coding and live art.

1.2. Live Art

Live art is a relatively recent term originating in the UK, which can be applied to many performance-based practices but all would share an insistence on experimentation and process-orientated or experience-based work. Live art has a closer link to visual arts methodology than with *performance art*, which is an alternative term originating in the US in the 70s. But both terms refer to time-based performances where there is a conflation between authoring and ‘performing’, a rejection of tradition and entertainment and often, linked to this, the rejection of traditional performance spaces such as theatres. We could also use the terms *body art*, *happening* or *action art*. All of these

terms have been contested at some point or other, but every one of them essentially approaches the same species of phenomena.

For the Live Notation project we chose to use the term *live art* because it points towards a strategy of *liveness* as opposed to a type or style of performance, and proponents of it tend to employ the term reflexively in their writing.²

That said, we are referring concretely to time-based experimental work realised through the artist’s body. That is not to imply the body as subject, which would be tantamount to anatomy, but to witness the artist’s body labouring in a meaningful or non-everyday fashion in front of our very eyes. Usually artists turn to a live practice out of a resistance to creating static art objects (one can argue they maintain and feed commodity fetish under capitalism), or a frustration with more traditional media that can arguably limit the social impact of the artwork’s meaning. Certainly, live art does not arise out of any foundational belief in the body per se, or in the artist’s superiority as a public figure or mascot, etcetera.

Sometimes live art works are figured completely through the artist’s physical body undergoing acts of great endurance. The body art works of the 70’s offer many seminal examples, such as Chris Burden’s *Trans-fixed* (1974) where he crucified himself – not for very long! – on a Volkswagen car. In other cases, the artist as a type of public confessor or agent leads the action and usually employs speech acts, such as the work of Andrea Fraser famous for *Museum Highlights* (1989) where she posed as a museum tour guide at the Philadelphia Museum of Art, literally performing institutional critique. Some live artists embody political urgencies, such as Thomas Ruller’s *8.8.88* (1988), which memorialised the Russian invasion of 1968 or Ron Athey’s early works such as *Four Scenes in a Harsh Life* (1994) which deliberately exploited AIDS related hysteria. In other instances, live art can become expanded to involve many participants, such as Suzanne Lacey’s *The Crystal Quilt* (1985-7) which involved large numbers of elderly women engaged around tables, with an aerial view that makes up a traditional quilt pattern, or more recently Vanessa Beecroft’s installation live art works where up to thirty identical body-shaped women, usually virtually naked, stand motionless confronting the visitors to the space, *vb45.9043.ali* (2001) is particularly striking.

Not that any of the above live works fit neatly into any category and there would no doubt be variation in which term any of those referenced would identify with. The areas outlined above are offered as a way for a newcomer to such practices to grab a handle on a complex, difficult and often confrontational form of human exchange.

The field, like live coding, is determined by the practitioners themselves. Key to understanding where live art

²“For this reason, the definition of what Live Art is as a practice, as distinct from recognising it when you see it, is frequently taken, even by those who think of themselves as practicing, teaching or writing in the area, as critically uncertain, contentious, even an unhelpful exercise.” Nick Kaye [5]

comes from (now in reference specifically to practices such as Reeve's) is to recognise that it is decidedly anti-theatrical, site-specific and usually performed once only. The action risks unfolding live over time un-rehearsed, experimentation is the aesthetic as opposed to formal beauty or 'excellence'. In fact, a live art work's meaning emerges through the very fact that the performer is not 'pretending' or even necessarily 'skilled' in terms of using the body; live artists are not trained in the way dancers are, for example, but that would not stop them dancing, if the idea-hood of an action demanded it. Intention and idea-hood is everything. So, the live artist is an ordinary human being prepared to *do* something in front of others in order to open up the potential of liveness *per se*.

Perhaps unexpectedly, a synchronicity/confluence between the practices of live coding and live art is now immediately apparent, not so much in terms of the aesthetics of the performances produced but in terms of the committed labour of the creative practitioner intensively involved in producing before an audience. Similar too is a quasi-stubbornness in refusing to employ standard conventions – the live coder rejecting standard forms of classical music and the live artist rejecting literal communication of ideas, instead seeking to embody them. This is not to be agent provocateur or punk rock – we would suggest instead that this 'anti-representation' arises from an investment in the form of the work for its own sake, coupled with a belief that to do so is not indulgent but often a way of intensifying the audience experience.

Just as live coders might benefit from considering their body-at-work in their performances and their code as extended meaning-full body (because the code is an integral aspect of the live work and has a presence that exceeds 'bits of information'), live artists might benefit from considering the incorporation of abstracted marks and symbols within their performances as a form of extended meaning-full body. Indeed some live artists are already moving toward such a suggestion – giving agency to mark making or written language within their work. In Brigid Mcleer's work *Vexations* (2007-8), for example, the action of living with a piano for a month and learning to play it is as much performed through large diagrams – part musical score, part gestures of erasure – as it is through fingers on the keys. More subtly, Yuen-Fong Ling transposes the traditional life class into a participatory performance where often he as 'master' is the naked body to be drawn by students whose labour processes become politicised. Again we see the body at work in conjunction with marks being produced and, in line with live art strategies, ordered by an idea-hood that can only be communicated via critical liveness. A few live artists are even considering private performance in the studio, in making a drawing or painting, to be something relevant to focus in upon (as in the case of Andre Stitt's most recent explorations). Whilst live artists have engaged with an array of issues related to the meaningful documentation of their works, recently extended to the 'material traces' left over after an action

³, the consideration of 'notation' within the execution of a live art work or the 'liveness' of notation to have affect is entirely novel and may open up new possibilities in live art practice and theory.

2. DIALOGUE

Hester Reeve (HR): Despite apparent differences between live coding and live art, we've had some very energised philosophical conversations and always seem to tune in to similar areas of value. Does this mean if we were to start work on a collaborative performance it would be straightforward?

Alex McLean (AM): Well I think the problems that might emerge could be interesting, and so in a way it would be a shame if it was straightforward! I think it will also be unlikely, as I think issues of the body are somewhat alien to computer programmers.

HR: And that's obviously not the case with live artists. And yet, I always start my process for a work from abstract ideas – philosophical issues as opposed to carnal ones. But of course, I am very interested in what my body then has to do in order to embody or be true to those ideas. This conceptual-idea basis to live art might mark another difference between our two practices. So, exciting but not straightforward.

AM: Yes it is interesting that in live coding there are two levels of content, the music and the code that generates it, and no-one really seems sure about what the purpose of showing the code is. Some suggest it is to enhance the experience of the music; I think it might just distract from the music but should be shown anyway because the alternative of showing nothing is worse. So the place that code has in a live coding performance might be understood better on considering why live artists show the body.

HR: For me as a live artist, the body-being of a live art work is obviously central, but it's not the core essence of that centre (it certainly can not be removed). I am not sure straight off what I do think is more elemental to the work than my body making it happen. Interestingly, I get that same sense of something 'elemental' (for want of a better expression) when I look at the code in a live coding performance. I also respond to the coder's body invested in labour at the laptop, yes, but the code is not mere result or documentation, because it has live agency but only as you witness it. The fact that there's that flicker of agency-without-a body is somehow deeply stirring.

AM: Yes I agree there is a question of what a body is. I have been rather enthusiastically programming for a couple of decades, to the point that code has been an important window of experience for me. Is my code part of my body? I am reminded of a discussion I had with my sister, when we realised that we had opposite roles for our bodies and minds. For my sister, her body was rational and her mind irrational, so for example her mind would want to jump on the next Eurostar train to Paris,

³For example, Trace Gallery established by Andre Stitt in Cardiff

but her responsible body would stop her. For me my body wants to go to Paris and my rational mind stops it. This kind of basic mismatch in bodily experience might also be a problem in our (as yet hypothetical) collaborative performance, could we be talking at cross purposes and not realise it? If such an incompatibility unfolded during a performance, that could be exciting, or it could result in 'failure'...

HR: For starters, I am not sure that our collaboration means that as a live artist my job is to confront you with your body or make you consider its 'performance.' For me that would be somehow to miss the point. And, as I just said, whilst the coder's presence is not 'dramatic' or 'presented' in any way, that concentration in the task which is witnessed through the coder's body carries its own kind of unrepresented beauty about it. That is meaningful somehow from a live art perspective, so I would see one aspect of my collaborative effort to affirm that in your practice. I use my body as a medium in my work because I feel it is (in our culture) extremely honest and somehow it demands people consider potentiality, the potential depth of human agency, which freaks most people out. For example, when Oleg Kulig runs around naked in a gallery or city centre as a savage dog, often biting people, audiences may claim to be shocked by his coarse actions which over turn social mores but to my view of things, the real shock that such live art actions force people to acknowledge, unconsciously perhaps, is that "none of THIS is true; we decided IT, we uphold IT and look, I am undecided IT. IT gets undecided relatively easily ergo you have the capacity to undecide IT." And of course, undeciding is as much a choice for something radically new as it is an abandonment of something.⁴ But, even so, of more importance is how a live art action I do enables an experience of significance for the audience, but I don't in any way mean 'Hester Reeve' as significant. It's almost ritualistic, without meaning that my actual performance mimics so called ethnic performance rituals. It's ritualistic on an 'elemental' level. I still can't get to what I mean by that other than (to return to your opening comment) it seems to link to questioning after what is the body? Not simply the flesh that makes me me and you you?

AM: I suppose the body is something through which we may speak, creating channels of communication for example by articulating the mouth or gesturing with hands. Something of substance, perhaps, but if we ignore that part then code could be seen as an extension of the body, as could other forms of writing[8]. And I think exposing the code is a gesture of honesty too, not caring how it looks to others, but just showing how you write. The laptop is physically present but I do not get the sense that it is moving, however, something is moving inside. The code is being constructed, in the process chopped up and reformed in different guises, and the computer process is moving, dancing around the instructions in the code. At times the listening audience in the room might

⁴Oleg Kulig often carries out his dog action, many cite as legendary "Dog" at Interpol, Fargfabriken, 1996.

be physically moving too, directly connecting their bodies in time with the looping structures in the code. Somehow this feels a bit uni-directional, the dancing bodies oscillating with the code, but the code isn't oscillating with the bodies. But having a live coder then modify the code completes the loop, and the feedback is complete and resonates. As for ritual, of course musicking is extremely ritualistic, a social activity played out in a culture, and reflecting culture.

HR: There is something about your 'body-being' in the work (which is not the same as how you move your body in the work or what you choose to wear, whether there is anything else on the table etcetera.) which seems pivotal, and this is the same fundamental aspect within my live art work. And body-being is not quite the same as the body. Somehow this sort of body-being within performance is as private actually as it is simultaneously public. Could we say that at the point of realising body-being, 'body' actually extends. Suddenly code becomes body, suddenly the space between my gesturing body and the object I am engaging with becomes body (the world becomes body?). That's why we need the 'very particular situation' of these performances. I'm struck by what you say about the 'out of placeness' almost of your audience sometimes moving in sync with the code. It's not wrong, of course, but perhaps it's not the best inhabitation of the work, it's a closure actually. So, in terms of working together, no matter how compelling the music is that emits from your live coding, I will not be 'moving to it' or the rhythm of the code appearing on the screen (it will affect me, of course). Similarly, it would be out of place if you felt obliged to change your coding ritual in order to some how 'accompany my actions.' That would not be extended body. You see, there seems to be a similar resonance going on in what is somehow at stake in how we both view our different executions. From my perspective, I am realising that I need added resonance in the space I am performing in because inevitably people can get too focused on my body resonance and then fall into the habit of focusing on 'Hester Reeve' as opposed to the body-being-ness of the human in front of them (and similarly this can be a closure of potential meaning). It is not that I need "Music" (I have avoided that so far in my works because "Music" is so powerful and can make even an idiotic gesture appear meaningful – and my art actions are, as I say, honest) but resonance. That your performance's resonance also carries 'sound-space' really makes me foresee a 'fullness' which may balance the 'harshness-obtrusiveness' of my physical actions. It will change the space in terms of resonance. Do you think performing in the same signifying-space as a body doing body-being stuff will amplify anything in your work?

AM: Yes it is clear that this is not a project where you dance to the code, and conversely that we will have no use of computer vision or other sensors that might make the code dance to you. But I think my work will be influenced, not necessarily during the performance but certainly before and after it. In anticipation I am rethink-

ing the time structures I want to construct through my code, shift away from the wholly grid-based acid techno I have become preoccupied with for the past couple of years and back towards looser time, not in terms of inaccuracy but in terms of describing musical events which organise themselves into heterarchies, rather than imposing a fixed grid upon them. Repetitions, and multiples of the number four are psychologically extremely important to me, but to the point where I need to fight against them through polyrhythmic patterns and musical arcs that end in chaos. This is an opportunity to create an important shift in my musical activity, influenced by your actions but as part of my own musical development.

HR: Is it possible to relate more about the coding aspect of your performance work to me - a non-programming person. Your type of coding is a curious mixture of abstract language and concrete making born in the same moment. Is it a logical process then?

AM: Well code takes much the same form as written text such as this, discrete alphabetic marks on a page. When we read a novel the text might evoke sensory experience, and when a computer turns code into sound it is an analogous process. So when that code is interpreted live, the senses can be manipulated through the text. The history of computer programming is in both mathematics and textiles, and I think the latter still offers the best metaphors for programming, following a knitting pattern, or giving a machine instructions which are woven into results. But of course with programming you don't feel the wool moving between your fingers, and code involves extra steps of abstraction; not just patterns, but patterns of patterns. Live coding reconnects these levels of abstraction with tangible experience, so half of you is lost in discrete language, and the other half is lost in a musical moment. This is a lot like speech, discrete words intertwined with musical prosody. So for you, how does this kind of notion of abstraction relate to body work, or notations of body work, in live art?

HR: Except with live coding, your brain is not in command of the end result in the way that it is when the weaver weaves or someone speaks to another. Or do you know exactly what sounds will emerge as you code, in the way that a pianist can anticipate what will happen with her fingers in a certain arrangement on the key board? It's hard to know how to answer your question. Notation is just not a term that has ever been used in association with live art, or not yet. The term has concrete relevance to the planning stages of theatre; a behind the scenes plotting things out before they happen, a casual but crucial memory jogger of what happens where, that no one but the director and actors ever see. But live art is realised-completed live, only the work's idea-basis might be 'notated' before hand, and at that as an exploration rather than a determination. I do make drawings leading up to a performance, more to cast a spell over the process and give me courage to go and do something that absolutely no body has asked for. I've always considered these to be drawings. But this new term we're playing with, "Live

Notation," promises something to me and more than the initial association of a performer's actions activating abstract symbols or mark making in front of an audience. My initial premonition of this is that it's the performance of notation that allows the elemental to inhabit it in some way, but for only so long as the notation exists.

AM: I might not know exactly what will happen when I change the code, but I anticipate what might happen. This is the same as a painter, who makes a mark on canvas, experiences the results, and decides whether it is good before making the next mark [6, p. 33]. So my brain is locked in a feedback loop with the code, output and the body - the brain has an idea and writes some code, the code is turned into output, and experienced through the body.

HR: So, are you insinuating that the value of the body in our respective performances is to maintain the 'world,' 'matter,' 'other humans' somehow as constituent in the form of the work but without the need to represent them? No resonance without any of those things?

AM: Yes I think I agree with that, at least as a starting point. Shall we leave it there for now and write a conclusion?

3. CONCLUSION: LIVE NOTATION: ACOUSTIC RESONANCE AND NON-COCHLEAR SOUND

"Non-Cochlear Sound addresses sound as a conceptual, contextual construct. Non-Cochlear Sound might function in a sound-like fashion without specifically referencing or making sound, it might use sound as a vehicle for transporting ideas or materials from point A to point B, it might even make sound but only as an excuse for initiating other activities. Sound always makes meaning by interacting with other things in proximity: geographic proximity, ideological proximity, philosophical proximity. Non-Cochlear Sound is nothing more - and nothing less - than the acknowledgement of this reality."

Exhibition statement by Seth Kim-Cohen, Non-Cochlear Sound, Diapason Gallery, NY, 2010

As our dialogue between live coding and live art demonstrates, 'Live Notation' is not about an exchange of techniques or skills (although we are open to the need arising) but instead, and perhaps a little surprisingly, more about excavating ontological concerns in order to understand and support deeper, concealed 'shared space' that lies at the heart of both practices (at least in terms of the authors' particular exercise of them). This shared space seems linked to resonance rather than any type of content, a resonance that can only come to bear through the presence of the body. However, it is not the body alone that is read, it is what we describe as "extended-body." The notion of non-cochlear sound seems particularly apt for

helping us ‘grasp’ this concealed shared space that is as conceptual as it is physical.

Non-cochlear sound most obviously links to the musical aspect arriving from the live coding side of our potential performance collaboration; the music from the live coder’s actions is closer to the patterns of the programming aspect of the performance, than to the recognised patterns of sound made for the audience’s ears. It is as much a spatial resonance as it is music to be heard or danced to and this point is amplified by the showing of the code. But ‘non-cochlear sound’ also enables us to posit the body of the live artist to be similarly construed and received by an audience as a spatial resonance rather than a figure-personality. Following Lefebvre’s examination of spatial practice in the public arena [7], sound acts as a mediator that locates the body in relation to other bodies. Expanded and conceptual notions of sound may be more important to live art than it currently acknowledges.

In our dialogue above, both live coder and live artist think through this notion of spatial resonance and realise it as dependent upon the body-at-work or body-being element in both performances. In this context just what we mean by a body is brought into creative and philosophical questioning. Is the body of the performer here as much an amplifier of spatial resonance for other human bodies and in this context can we speak of other non-human aspects of the performances as ‘extended body?’ Something ritualistic is suggested and embraced if not fully understood as of yet.

Are we simply getting carried away by ideas? It must be admitted that this paper stands as an initiation of the project – whether there is any weight to these posturings can only be answered through realising a collaborative live performance.



Figure 1. The Live Notation logo, evoking a cave painting hand-print, marked with discrete lines.

One concrete step we have taken towards collaboration is to produce a logo for a research project under the banner of ‘live notation’. Less to brand our endeavour and more to establish a talisman for its journey. We are taking a risk and are aware that there is something linked to ritualised communication that connects the practices. The live notation logo takes inspiration from some of the first marks left by mankind – the hand-prints such as those found in the Pech-Merle caves in France. Three geometric, digitalised, straight lines cross the palm area, allow an association between ancient and contemporary. In these ancient caves sound and mark making were used as part

of ritualised communication. Often red dots of colour are daubed around the hand prints, and scholars suggest that these mark points of aural resonance within the caves that the tribes people would have exploited in their rituals. Some scholars have gone as far to name such events as the first ever rock concerts [11]. It is hard not to think that aspects of these performance-rituals were about inhabiting – if temporarily – the world as extended-body.

4. ACKNOWLEDGEMENTS

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