

## Sounding time: explorations of audio time-lapse and temporal layering in interdisciplinary collaboration

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Title: Sounding Time: explorations of audio time-lapse and temporal layering in interdisciplinary collaboration

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### **Abstract**

In this article Evelyn Ficarra considers her compositional practice, giving particular emphasis to the techniques and aesthetics of using time-lapse media and other temporal manipulations in interdisciplinary contexts. Foregrounding the author's collaboration with media artist Ian Winters on the large-scale interdisciplinary installation / performance *Summer, Winter, Spring*, it describes the composer's attempt to model audio temporal methods on techniques borrowed from the visual realm. It considers temporal compression, extension and layering as compositional tools, highlighting issues of scale, structure and experience, and suggests that radical temporal manipulations of material can serve to bridge referential and abstract sound worlds. It concludes with reflections on the meanings and poetic resonances of time-lapse media.

### **COMPOSITIONAL CONTEXTS**

My focus as a composer / sound artist has long been the borders between music and sound, using recorded sounds (environmental, mechanical, human, instrumental, etc.) manipulated electronically to play in the space between real-world reference and musical abstraction. Lately, through my collaborations with media artist Ian Winters, the issue of temporal experience itself has become more central. Music is already a structuring of time, both for the

composer and the listener. But music which uses recorded sound as material, layers that temporal experience further by using captured time – recorded sounds as past, as memory or trace, brought into an eternal present with each fresh hearing.

Media artist Ian Winters' interdisciplinary performance installations explore temporality through traditional methods of filmed time-lapse alongside a range of other techniques including slow motion, durational performance and site-specific interventions involving many collaborators. As a composer / sound artist who has worked with Winters across numerous projects [1], I am increasingly aware of how this temporal focus is reshaping my compositional processes both technically and aesthetically, particularly as regards ideas around audio time-lapse, temporal layering, and memory. Here I will be considering these ideas through the lens of a specific project, *Summer, Winter, Spring*, a hybrid performance installation involving video, sound, filmed site specific performance and live performance, particularly featuring time-lapse material and the poetic resonance it evokes.

### ***SUMMER, WINTER, SPRING***

Ian Winters' *Summer, Winter, Spring* (2016--2018), was commissioned by the Kenneth Rainin Foundation as part of the Mid-Market Street Initiative in downtown San Francisco.



Fig. 1. Publicity still depicting Civic Center in San Francisco. From *Summer, Winter, Spring* 2018 © Ian Winters.

This work explores how the seasons express themselves in urban spaces, capturing the rhythms of human movement and the longer form movement of light. Winters made a year-long time-lapse film of Market Street shot from an office window at 1 Grove [2] and a series

of day-long time-lapse films shot at ground level at Civic Center / UN Plaza. Each of these latter films were made on or around solstice / equinox dates, and featured choreography and performances by collaborators Paige Starling Sorvillo (Summer), Mary Armentrout (Winter), and Daiane Lopes Da Silva (Spring). During filming, done primarily through still images shot at intervals of 1 to 10 seconds, the performers move with infinitesimal slowness, but when the still images are animated, the performers then appear to be moving in normal time as the urban world swirls in a swift river around them. The end product was a series multi-channel audiovisual installation pieces. [3] In addition, at the culmination of the gallery run, two evening performances featured those same performers again, dancing with their filmed selves to live video and acoustic and electronic music. [4] My role was as composer and sound artist, initially in collaboration with composer Heather Frasch, later joined by percussionist Suki O’Kane. There is also a two-channel film version of the project. [5].

## TIME-LAPSE



Fig. 2. Still from Market Street time-lapse, *Summer, Winter, Spring* © Ian Winters.

Time-lapse is a common technique in visual media - the sky that changes from day to night in a matter of moments, the flower whose day-long blossoming is reduced to seconds. Audio time-lapse, however, has been given less consideration. On this project, I was determined to grapple with the idea of audio time-lapse, and to see how using audio from the site of the filming, subjected to time-lapse mechanisms, might alter or enrich the audiovisual



experience. I was particularly interested to explore how Winters' visual techniques might translate into audio practice, so I tried to model my work closely on them, dividing them into three categories: Capture, Animation, and Performance.

## CAPTURE AND ANIMATION



Fig. 3. Summer 2017. paige starling sorvillo is pictured in the yellow cape during the shoot. Photo © Evelyn Ficarra.

Winters uses a variety of time-lapse methods, including a procedure in which he captures one still frame every five seconds (12 per minute) and then animates the stills at a rate of 24 frames per second. (This means it takes two minutes of real time to make one second of time on film). As a further layer in the animation, the stills are processed through a moving crossfade of three or more frames in width, so that at any one time, one or more frames are fading in, one set is at full strength and a third set are fading out. As key formal elements the frame rate and width of the crossfade window are used in a flexible and varied way, to highlight movement and patterns in and out of legibility.



Fig. 4. A still from the time-lapse film. Photo © Ian Winters.

An initial challenge was to define what the audio corollary of a single still frame would be. A still photo contains a mass of visual information, but sound takes time to speak. Interested in the spaces between the recognizability of sound and its abstraction into more musical constructs, I asked, how big a temporal window, or sonic ‘grain’ (to borrow terminology from granular synthesis) is required for the ear to make sense of what it hears? Is ‘making sense’ important in this context? Might audio time-lapse techniques provide methods through which to explore a creative, moveable boundary between sound and music?

The first job was to collect audio data with which to experiment, sound recording most of the projects’ day-long shoots on Market Street and Civic Centre between 2016 and 2018. While intrigued by Andrew Spitz’s innovative time-lapse audio recorder ‘Phonolapse’, which runs through Max MSP [6], I opted instead to record continuous sound on a flash recorder and experiment with performing time-lapse processing on the files afterwards. Having continuous audio would allow me to experiment with a variety of grain sizes on the same piece of audio, and then compare and contrast my results.

My intent was to create an audio time-lapse sound world that would work rhythmically with a wide range of time-lapse imagery, rather than to get exact synchronisation with any given

shot. The shots were quite wide and busy, so there was a lot of choice for sonic focus. Suspecting that a feel for rhythm, textures and movement would count more than either precise synchronization or documentary realism, I let my ear be my guide, wandering towards the most interesting sound events, trying to capture the sonic character of the space in all its variety.

## **AUDIO TIME-LAPSE ENGINES**

Stage one of the audio animation phase was to determine what size of audio window or ‘grain’ to use for the retrospective time-lapse process. Echoing the length of the video frame, I started with a sound grain size 40 milliseconds (ms) for my initial experiments. Using the software package Max MSP, I constructed a ‘time-lapse engine’ to select and play three 40ms grains of material from every five seconds of the original sound recording – one fading up, one at full strength, and one fading out. I also reproduced Winters’ visual method of overlapping streams, with two other time-lapse engines playing different but contiguous material from the same original sound file.

In addition to grain size, two elements of timing were crucial: the rate at which the grains were triggered within an individual engine, and the delay or offset before which the next engine was triggered. A rate of 40ms for both created an extremely dense, fast moving texture in which sped through the source material very swiftly – in fact, six minutes of the original audio was used in making only one second of ‘film’ time. The effect was a stuttering, fluttering sound, choppy and digital. Little of the original character of the sound file was intelligible, it was primarily a rhythmic textural effect. [8].

Intrigued to discover at what point some elements of soundscape would become recognisable, I continued to experiment with different grain lengths, trigger rates, and offsets. Expanding the trigger rate to 120ms created a lighter texture which allowed just intelligible fragments through, such as the honking of a horn, or the fragment of a voice, and made a more gradual progress through the original recording, with just over 40 seconds of the original required to make one second of new audio. Larger grain sizes from 240ms to 960ms, with proportional extensions to the trigger and the offset rates, allowed more detail and character to emerge and a possibility of recognisable events – a speeding police car, an argument amongst seagulls. The layering and offsetting of the grain streams induced shifting cross-movements in the stereo image, adding another layer of rhythmic interest.



## PERFORMING FOR TIME-LAPSE

A crucial aspect to Winters' project was the element of durational physical performance. Our dancers moved with near-infinite slowness across the urban space. In the resulting time-lapse film, they seem to be moving at 'normal speed' in 'real time', set against other normally invisible visual rhythms: (a) people and traffic swirling in a blurred river; (b) the movement of light and clouds and (c) the dense immobility of buildings. How could I create a musical corollary to these elements? I had the idea of recording an exceptionally slow musical performance, on site at Civic Center, that would seem to be in 'normal' time once processed through the audio time-lapse engines. For the winter shoot of 2016, I took my flute to Civic Center, sat in shot at the fountain and played an improvised melody for the roughly two-hour take. I started with very long slow tones, but after a while, I began to speed up, playing more rapid tremolos and loops, before winding down again to slow notes. This gave me a chance to experiment with how ultra-fast as well as ultra-slow materials would behave in my time-lapse processes.



Fig. 5. Evelyn Ficarra recording her flute at Civic Center, Winter 2016. Photo © Ian Winters.

I made two recordings of roughly 1 hour 40 mins each and fed them into the audio time-lapse engines. The sonic hubbub around the flute was a blurred swirl of activity from seagulls, traffic and human conversations. The continual white noise of water from the fountain was the corollary of unmoving buildings. My ultra-fast playing had a tendency to disappear into



the general hubbub, becoming a kind of textural smear, nevertheless the timbre and pitch range of the flute allowed it to retain some sonic distinction even at high speed. Using pitch and timbre in this way could be seen as a corollary to color in visual time-lapse, where a bright red or yellow costume will help a figure to stand out.

## **MEDITATIONS ON TIME**

In order to be visible as an individual in time-lapse media, one needs, as a human body, to experience extreme extension of normal every day pace. Playing very slowly, for a long time, and holding very still was a kind of public meditation. One member of the public thanked me when I had finished, saying that this had changed his perception of the space and allowed him to feel slowness and calm. I too felt in an altered state after playing, and this made me think about the layering of different time scales, and wonder if there would be ways of getting that feeling of slowness one experiences when performing for time-lapse into the final ‘product’ of the installation films and performances. To explore this I took the flute recordings, stretched them and slowed them down, creating a number of layered drones. This revealed hidden sonic details, for example the haunting melodic nuance of slowed-down birdcalls. These moments, used particularly in the *Spring* section of the piece, provided a much-needed counterbalance to the audiovisual flurry of rapid time-lapse material.[9] Combining radical stretching of sound files with radical fragmenting / compressing through audio time-lapse, provided material for complex layering of time frames and temporal experience.

## **TIME-LAPSE IN AUDIOVISUAL CONTEXTS AND PERFORMANCE**

Having experimented with different time frames of audio my next stage was to determine how the sounds worked with the images, and later, how they could be deployed in the live performance installation.

There were two main issues with the time-lapse audio material. First and foremost were the rhythm and tempi they contained; next was the content they offered. Rhythms which matched the frenetic pace of the visuals worked well – supporting and giving audible life to that movement. The time-lapse process at its most extreme speeds erased the ‘recognizability’ of the sound, and tended towards abstraction. As the sound window widened and more sense was let in, real-world associations would jostle for attention and questions of audiovisual relationship might shift from rhythm to content. As the sound became more musical, the

image (e.g. of a busy urban street moving from morning through to dusk) became more like choreography; if the sound were more urban and concrete, one noticed more about space and place.

The bedrock of the audiovisual relationship is rhythm. As long as a fluttering piece of audio matched the pace of the image, the audiovisual relationship seemed to ‘work’. Similarly, if the sound seemed completely ‘still’ (as with a drone), the audiovisual relationship resonated well, as the swift visual rhythms had a firm sonic anchor. By contrast, when more relaxed time-lapse sounds were juxtaposed as a single exposed layer with rapid visuals, they often awkwardly highlighted that the sounds were semi-recognizable, but not synching up with anything on screen. [10] If the sound is slower than the image, and more intelligible in a way that does not match that image, then the image may seem to ‘resist’ [11] the sound, and vice versa. To counter this, a composer could try to bring out synch moments, through gestural / rhythmic means, to establish a more coherent relationship between what is seen and heard.

Sound can create off screen space as well as highlighting onscreen movement. Sometimes further depth could be added by having more than one time-lapsed audio track playing at a time; one fluttery track to catch the swift movements of cars and people, and a slower track to add to the sense of off screen space – seagulls, urban ambiance, and so on. Temporal manipulations of the soundscape help movement between reference and abstraction, between sound and music, and between seeing image as choreography, and seeing it as representation of real place and space.



Fig. 6. Mary Armentrout on stage and at Civic Center, January 2018. Still from performance documentation by Loren Robertson Productions. © Ian Winters.

The audiovisual relationship is strongly focused in the fixed media elements of the *Summer, Winter, Spring* installation. However, once live performers were brought back into the mix, both music and video became subject to the choreography, shifting my focus as composer almost entirely to the performers' rhythms and structures, as the central part of a new hybrid whole. The shared 'real time' of performers and audience puts a specific frame around all other media, grounding it in the rituals of performance. In performance, audio time-lapse material can become just one musical element among many. At the same time, the tension between multiple elements – the interior gallery space with filmed exteriors; filmed performers with their live selves; the sounds of urban street-life manipulated amidst live percussion and abstract electronic music – creates a complex experience layering time, space, and versions of reality.

### **TIME-LAPSED MUSIC**

In my next collaboration with Winters, *Listening Creates an Opening* [12] I explored how audio time-lapse techniques might be used on musical rather than soundscape material. Working with cellist Patrick Belaga, I recorded a number of cello improvisations which I then fed to my time-lapse engines. The resulting material – a flurry of notes, a technologically induced stretto, a radical compression and fragmentation of material – were

then themselves edited and recombined to produce more complex musical structures. Using the time-lapse techniques across a range of source material (including soundscapes) became a sort of through-line tying the material together, allowing musical and non-musical sources to speak to each other. I experimented with further temporal manipulations of this re-worked time-lapse material, up to 75 times faster. Such speeds make almost any pitch-based sample sound like an electronic oscillator, but when the speed is gradually reduced, the sound comes ‘back to earth’ and reveals its nature (e.g., as cello). [13] Perhaps all ultra fast iterative sounds have a certain sameness; sameness that can become an elegant bridge between abstract and referential sounds, allowing for flexible movement between them, as a structuring element.

## **FURTHER REFLECTIONS**

A focus on audio time-lapse and temporal layering has given me more ways to explore the boundaries between sound and music, and has rejuvenated my outlook on rhythm and audiovisual relationships. Thinking about large-scale movement and interlocking rhythms of ‘real’ life, as captured through audiovisual media, highlights compositional issues of scale, proportion and rhythmic relationships, which resonate at every level of compositional process.

R. Luke Dubois (2011) in his article ‘Time-Lapse Phonography and the Visual Processing of Music’ [14] posits that the aesthetic experience of listening comes in two categories— one, the act of listening itself, and the other, the act of remembering what we have heard. In my audio time-lapse methods, the largest proportion of the sound files remains unheard. Perhaps when we listen to time-lapse material, whether music or sound, while accepting the rhythms and shapes for themselves, we also try to fill in the gaps, and imagine what is missing. Time-lapse is haunted by experience that is lost, allowing us to embody a ‘memory’ whilst still in the act of listening. I think this helps account for the deep resonance of the temporal layering in time-lapse audiovisual forms. They have our lived experience of time itself as core material.

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## References and Notes

- 1 Winters’ other main collaborator is choreographer Mary Armentrout; e.g. *The Woman Invisible to Herself* (2010); *Reveries and Elegies* (2013, 2015); *Listening Creates an Opening* (2018). I worked on these projects as composer / sound designer.



- 2 An interesting comparison to Winters' work is Arthur Wicks' *Four Seasons* (1981), 8mm, 20 mins. Pacific Film Archive. Excerpt available here: <[www.vimeo.com/192390560](http://www.vimeo.com/192390560)>
- 3 *Summer, Winter, Spring* was premièred at the San Francisco Arts Education Gallery in the Minnesota Street Project, running as an installation from 13-21 January, 2018, with live performances on 26 & 27 January.
- 4 For performance documentation see <[www.vimeo.com/271942156](http://www.vimeo.com/271942156)>
- 5 The two-channel film version is available to be viewed here: <[www.vimeo.com/289963649](http://www.vimeo.com/289963649)>
- 6 Spitz, A. (2012). The Phonolapse patch / project is here: <[www.soundplusdesign.com/?p=5059](http://www.soundplusdesign.com/?p=5059)> . An interesting discussion is here: <[cdm.link/2012/04/what-if-you-could-make-timelapse-out-of-sound-free-macwindows-app-made-with-max/](http://cdm.link/2012/04/what-if-you-could-make-timelapse-out-of-sound-free-macwindows-app-made-with-max/)>
- 7 Audio examples are available in supplemental materials.
- 8 See [7].
- 9 Examples of these flute-derived drones can be found from 10'30" of the two-channel film version of *Summer, Winter, Spring* at <[www.vimeo.com/289963649](http://www.vimeo.com/289963649)>
- 10 See Dawn Lyon's time-lapse film 'Billingsgate Fish Market' for an interesting example of compelling awkwardness in an audio-visual time-lapse. Her visuals are at a uniform swift pace, beautifully compressing several hours of market time into six minutes, whereas the audio is resolutely pedestrian in 'real time'. The resulting sound-image relationship is more cerebral, as perhaps befits a film that is as much a piece social documentation as an aesthetic document. Lyons, D. (2016) 'Doing Audio-Visual Montage to Explore Time and Space: The Everyday Rhythms of Billingsgate Fish Market'. *Sociological Research Online*, 21 (3), 12. DOI: 10.5135/sro.3994
- 11 Chion, M. (1994) *Audio Vision: Sound on Screen*. New York: Columbia University Press. See Chapter 10, An Introduction to Audiovisual Analysis.
- 12 *Listening Creates an Opening*, Mary Armentrout Dance Theatre (2018), commissioned by the Experimental Media and Performing Arts Center. Further information can be found here: <[www.evelynficarra.net/portfolio/listening-creates-an-opening/](http://www.evelynficarra.net/portfolio/listening-creates-an-opening/)>
- 13 An example of this sort of transformation can be found in the last two minutes of the River Time-lapse film from *Listening Creates an Opening* <[www.vimeo.com/290054191](http://www.vimeo.com/290054191)>

Ficarra, Sounding Time, Friday, 8 May 2020

14 Dubois, R. Luke. (2011) 'Time-Lapse Phonography and the Visual Processing of Music'. *Journal of Visual Culture*, 10 (2), 247-250.

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