Working with brevity: Short soundfiles in electroacoustic composition

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ABSTRACT

Working with short soundfiles *en masse* in the fields of fixed media (acousmatic) and mixed music (instruments and electronics) has raised questions regarding useful assemblage and handling techniques. This paper traces out some different processes and systems that are currently in circulation to automate and assist in such sonic distributions. A number of personalised techniques for sound organisation of breif sounds have surfaced in the author's own outputs in response to working with short sound *en masse* for many years. Using excerpts from my own fixed media works*; Ice Breaker* (2015), *Snap Happy* (2017*)* and *Landline* (2018), this paper will reveal how new modes of micro-montage can assist in marking out structure and referencing in music making. The techniques, applications and compositional aesthetic of micro-time and micro-montage, first articulated by Vaggione (1994) as observed by Roads (2005) will be discussed and used as a springboard into new compositional methodologies. Implications of using naturally occurring minute materials (milliseconds in duration) distinct from truncated materials (cut up, or shortened) will be compared within a discussion on organic versus artificial-sounding output. To conclude, the author will reflect on the creative results of handling large numbers of short sounds and how this defines her output as a compositional trait.

1. INTRODUCTION

Short soundfiles (up to 1-2 seconds in duration) have preoccupied my music making for the past 8 years. These materials, collected from the real world (recorded, not synthesized), have been used as the main feature within a series of pieces; *Switched on* (2011), *Time will tell* (2013), *Ice Breaker* (2015), *Snap Happy* (2017) and *Landline* (2018). Recordings of objects (on/off switches, clocks, ice cubes, cameras and telephones respectively) have yielded tiny sound materials, often milliseconds in duration. Assembling these materials into a composition requires a large number of files to fill and occupy an 8-10 minute long piece. Dealing with so many short materials can be a complex process regarding how to stich such minutia together both in the horizontal and vertical domains. Research in this area has been initiated to discover the possibilities of short sound use *en masse*, and asks *'can these materials be entirely relied upon within a work of fixed media music'*? And *'can they be subjected to the visual sound-shape methodology of composing as proposed in Blackburn (2011) as a development of Smalley's spectromorphology*'? The answer to these questions in undoubtedly yes, however the literature surrounding this positing is slim and the impetus and methods used to work in this way appears fairly undefined or patchy.

2. Short soundfiles

2. Why short sounds?

Audio data that is short in duration is no less valuable in composition than longer material. Sound material that is naturally brief often contains transient attack data e.g. an impact. A clap is a good example here as it has a large peak and quick decay lasting no more than 100 milliseconds.

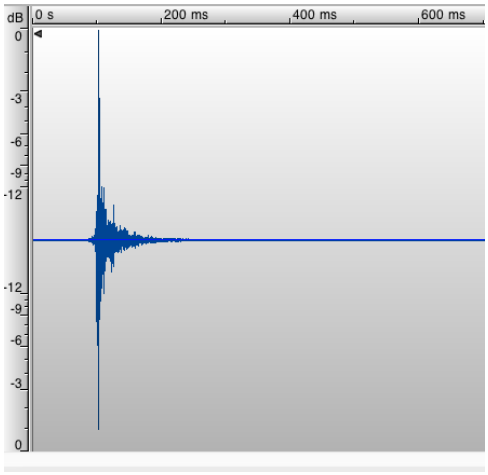

Figure 1. Waveform of an acoustic clap sound.

Other naturally short sound materials include: a light switch flick, a balloon pop, a footstep or an egg crack. Providing the recording conditions are dry for a less resonant result, these sounds will be under a second long. My interest in this area is the audible and creative potential of assembling many such brief materials together. This assemblage might happen in a short cluster, a morphological string or a longitudinal process such as a crescendo. Short sounds are also attractive from the compositional perspective of control. A composer of fixed media music often attends to a multitude of decisions for each sound appearing in their sequencer – if this process is applied to each and every short sound found in a work, quality control may be enhanced or improved. Roads refers to this succinctly as performing "microsurgery on individual

points." (Roads 2000:302). Working with short sound files *en masse* has certainly enabled a closer level of control in my music, satisfying a particular 'control freak' attitude towards detail.

Naturally occurring short sounds require close microphone techniques for capture, often due to their insignificant, amplitude-lacking profiles in reality. Take for example a stapler sound – this is a brief action (down/up) with a low dynamic profile. The use of close mic techniques e.g. 2-3cm away from the source, can capture unheard detail and in composition this can translate as a fairly disproportionately loud sound for the source in question. The close microphone captures detail that often goes unnoticed in everyday life and exposing this in composition leads to 'hyper-real magnification' (Roads 2015:86).

3. Short sounds in the repertoire and practice

Brevity, short sounds and smallness are concepts that have captured the imagination of other composers in the field.

- JLIAT (James Whitehead) created *The shortest piece of music* (2000). This work lasts 1/44100 of a second.
- Pete Stollery's *Shortstuff* (1993) explores the world of short sounds through accumulations of brief samples. "The sounds in *Shortstuff* are brief, crisp and fleeting. They gather together to form exquisite gestures and subtle textures."[1]
- Markus Popp from electronic music group, Oval has talked extensively about his short sound use in his music making. "You have these tiny frames of sound and you have to make an effort to make them move over time by gluing these tiny pieces one after another. The sounds in the archive are basically just tiny sound files, which would not make any sense at all if they're played on their own."[2] The intricacies of Oval's output are certainly observable and the gathering of these tiny materials heightens this. "Popp has created an archive consisting of tens of thousands of tiny sound files. This archive serves both as the ultimate source for all the sounds used in his music, and as a resource for generating further archive material …Popp's work in creating an Oval track comes in assembling these tiny sound files to create longer, evolving sound fragments, which can in turn form part of a complete musical track."[3]
- Horacio Vaggione's repertoire of work provides excellent examples of short sounds in action, especially in reference to his works *Schall* (1994) and *Nodal* (1997), which express the 'micro' implemented *en masse*. Interestingly his techniques and application of brevity is often used to fill time (between individual sounds), leading to impressions of whole occupancy, as rather than bitty, scattered-ness. For example, the silence or emptiness between individual sounds is filled out to enrich the textures on display. Total coverage (without silences/space between sounds) through short sound use is an interesting concept to contrast with the dotted texture of a time frame created with tiny sounds. Vaggione's work *Fractal A* (1983) uses a sound granulator that "chops a continuous sound up into tiny sound particles" leading to a "powdering of the sound material." (Vaggione 1983). Vaggione uses the CARL system as a method of selecting "portions of soundfiles and creat[ing] new files containing only these selected portions.[4]
- Artist, Yukio Fujimoto presented his 'small sounds' at the Venice Biennale in 2007 and has focused on the concept of 'smallness'. Fujimoto "became enamoured with everyday, meaningless sounds, such as the clink of a cup being placed on a table or a page being turned in a book. …This drew his thinking to the particular forms of attention required for hearing "smallness." He reminds us that "('Smallness') isn't easy to hear …the minute one turns their attention to something else, (the sound) quickly disappears." This perspective is significant here for reiterating the insignificant nature of brief sounds. Directing the audiences' attention back onto these short materials is a challenge often overcome by the reconstitution of brief sounds to build a longer whole.

4. Short sounds *en masse*

4. Short sound clustering

Bringing many short sounds together has a number of attractive features and affects upon music making. Short sounds together indicate detail and suggest granular behaviours or tactile, dynamic textures. The busyness of a short sound cluster (multiple short sounds together) is also effective within fixed media music creations. This busyness is exaggerated with soundfile density; packing a given time frame with many short sounds can indicate highly detailed textural information. My research in this area has focused on re-consolidating many short sounds taken from a given object back together, something I

[1] Stollery, *Un son peut en cache une autre,* (2006) CD liner notes.
[2] Inglis, *Sound on Sound*, 'Markus Popp: Music as Software', 2002. (Accessed 18/12/18, https://www.soundonsound.com/people/oval-markus-popp)
[3] Ibid.

[4] The author is also aware of the IRIN system developed by Caires (a student of Vaggione) to carry out micro-montage procedures. See Caires, 2004 for full documentation.

term: '*en-masse* reconstitution'. Taking ice cubes as an example from my fixed media work, *Ice Breaker* (2015) these were placed in water immediately from a freezer to capture the effect of differential expansion, resulting in a short crack sound. Collecting hundreds of iterations of these cracks (different pitches, attack sizes, and amplitude variants) as a means of capturing subtle variations of this natural phenomenon provided a suitable folder of short sounds for clustering activity (close to 200 individual sounds). Bringing them back together, arranging them in an audio sequencer suggests a hyper-real image of ice cubes cracks, orchestrating a cacophony of different variations of ice cubes. A sense of reality is maintained due to the lack of sound processing, but subverted purely by the sheer amount of short audio files in a given space. The piecing back together of sound materials is demonstrated in a visual metaphor in Figure 2 where each dot/point refers to an individual sound recorded from the source. Stepping back from clustering of short ice sounds reveals the implied object of a cold beverage. In this example, there is an analogy to the painting technique of pointillism.

Figure 2. Visual metaphor for *en masse* reconstitution

4.1 Micro-montage methods

Micro-montage is described as "the assembly of many short sounds in high densities" (Roads, 2000:296) and links closely with the concept of micro-sound and micro time scales. In this technique, a "composer extracts particles from sound files and rearranges them in time and space" (Ibid). The term 'extraction' is important here since it appears to indicate fragmenting, truncating or cutting short an existing sound (see Figure 3). My own preference is upon wholeness as opposed to truncating.

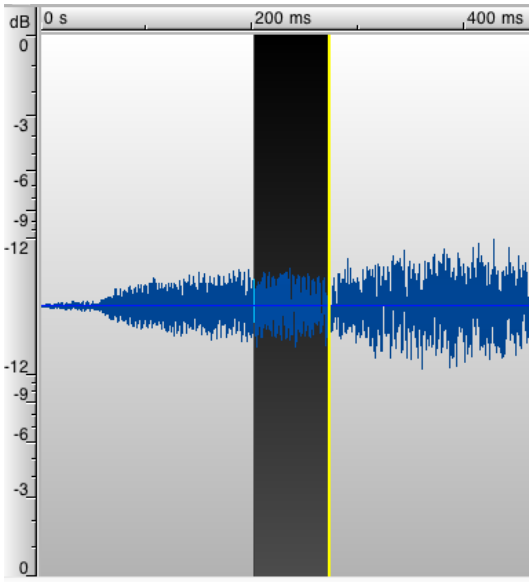

Figure 3. Selecting a fragment from a longer soundfile for truncating.

Shortening of materials can leave a blunt edge (Figure 4) and this effect can sometimes cause a choked, artificial presence, without the natural attack decay profile inherent to a given natural sound (see Figure 1 for natural profile).

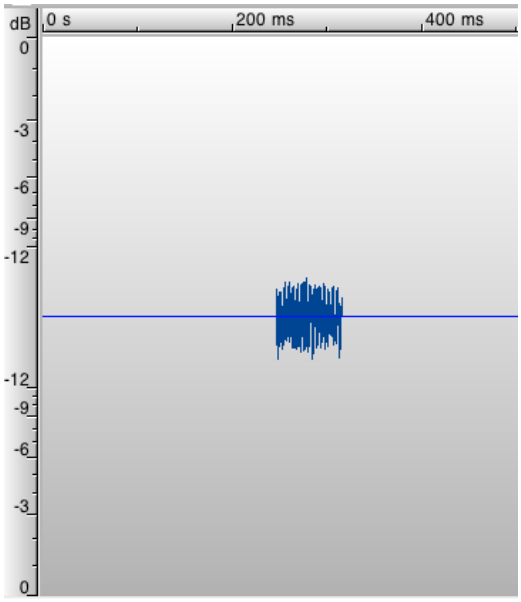

Figure 4. Blunt edges arising from editing longer sound (Figure 3) into a shorter sound.

There is an audible difference in working with fragmented sound versus naturally short sound material. This is primarily due to the 'organic' decay presence inherent in the naturally occurring short sounds. Fragmenting, as shown in Figures 3 and 4, also removes a sound's transient information and its trajectory, resulting in a sense of incompleteness. Another issue worth mentioning here is that my focus on short sound use is a separate consideration to granulation. Roads makes it clear that micro-montage and granulation are distinct from each other but share many features. Granulation is an automatic process whereby the "composer's brush becomes a refined spray jet of sound colour" as opposed to the 'particle by parti-

cle' approach belonging to micro-montage that "demands unusual patience" (Ibid). An important point to emphasise here is that my own interest and research is not upon granular synthesis techniques, but more focused on the collation of short sounds within a given time frame.

4.2 Single sounds multiplied

Some processing systems and VST plugins enable a single short sound to be multiplied and scattered in time. Delay is a classic technique, which presents a linear distribution of a single sound, staggered in its repeated entries. Inputting a single sound into the GRM Space Grain[5] "enables the generation of up to 100 grains and their placing in a multi-channel sound space." Processing single sounds to achieve multiples achieves an automated micro-montage sound unit useful in composition, unified through the replicas of the original sound input.

4.3 Multiple sounds distributed

Micro-montages created through multiple short sounds can capture greater diversity in sound qualities and may yield particularly engaging sonic detail. In my own compositional activity, I have developed a number of strategies for bringing large numbers of different short sounds together in manual assemblage.

4.4 Vertical composite packing

Within a sequencer short sounds may be arranged manually in audio tracks (Figure 5). Filling a brief time frame with many short sounds and then bouncing/exporting this out of the sequencer can be used as a technique to build complex moments into a given work.

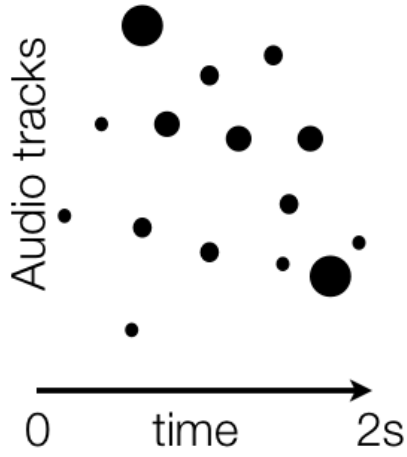

Figure 5. Dots denote the use of short sounds in a short time frame within a sequencer.

[5] INA GRM Tools Spaces bundle: https://inagrm.com/en/store/product/15/spaces (accessed 18/12/18).

Re-importing this bounced audio file (now as a single composite soundfile) can allow for further 'packing' of the timeframe with more short sounds to add to the micro-montage sound (Figure 6).

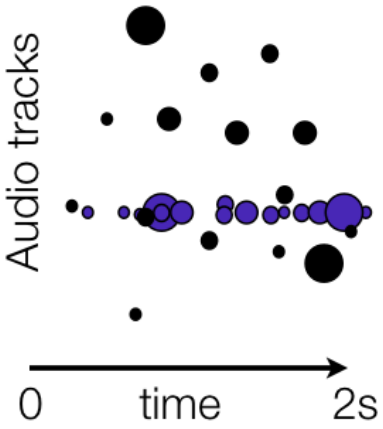

Figure 6. Further short sounds can be added to the re-imported sound file to increase the density of the micro-montage.

This process of exporting and re-importing may have several iterations for a satisfactory result. A level of density will be achieved through the use of this technique. This material has been especially useful in composition situations for marking out busy, active areas and also within structurally important moments, for example, a climactic build, and a shift in space/location/section. These clusters can also act as onsets or terminations. I have noticed that highly dense moments of sound clustering function much like 'cadential decoration' in my music as a means of preparing the end of a phrase, section or the entire work.

4.5 Manual micro-montage

Piecing together short sounds in a sequencer has dominated the last 6 fixed media works I have completed in the past eight years. Taking naturally occurring short sounds and reassembling them into new composite shapes has demonstrated a very personalised and time-consuming approach to composing. In my work *Time will Tell* (2013), the opening section is created through an *en masse* reconstitution of short sounds each derived from different clocks (individual tick tock audio recordings). Collating them in this way creates a 'hyper-real'[6] clock evocation, one that alludes to reality, but is entirely fabricated through manual micro-montage (Figure 7).

[6] Field, 'Simulation and reality: the new sonic objects', "Most commonly, the term hyper-reality refers to a situation where events appear to be 'more real than real'. Although these events are undoubtedly produced by the processes of simulation, the result has all the gestures and signs of reality." P45.

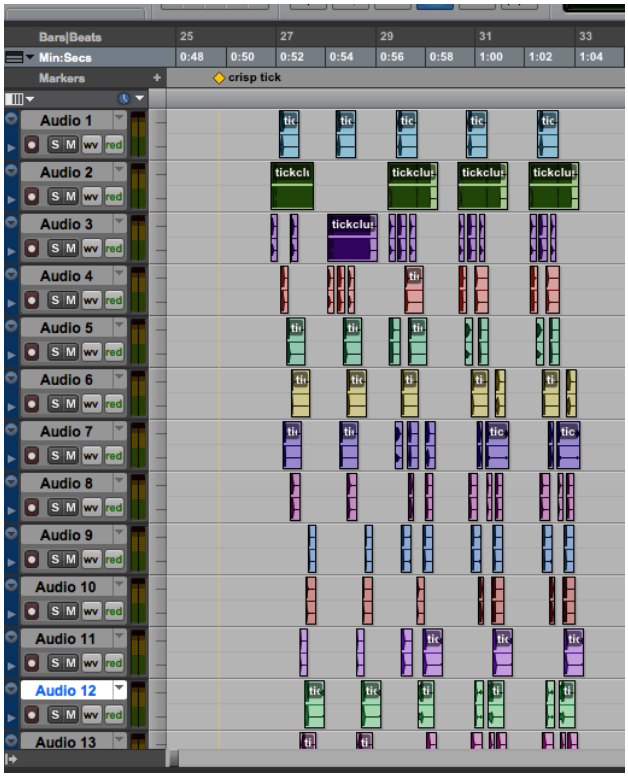

Figure 7. A Pro Tools screenshot of the opening to *Time will Tell* (2013.) Stacking of individual clock ticks implies a larger, more elaborate composite clock object.

4.6 Clustering with visual sound-shapes

Using visual sound-shapes (Blackburn, 2011) as templates for short sound clustering has provided a further personalised approach for composing with short sounds. Inspired by Batchelor's clatter (Max/MSP incarnation of the sound toy *Tiles*[7]) I have established my own system for clustering short sounds over specified timeframes. Using the matrixctrl object in Max/MSP to animate the clustering of short sounds *en masse* through time enables short sounds to be collated together in different configurations to create composite sounds. In Figures 8 and 9 each circle/button refers to a different short sound playback.

[7] Batchelor, "Clatter appears similar to brassage or granular synthesis insofar as it combines (usually small fragments of sampled data to create larger gestural shapes or textures. Unlike these tools, however, which fragment material arbitrarily, each triggered sample in Clatter maintains its full morphology and existing gestural profile, which in turn, perceptulally lends greater gestural realism to the outcome." (website accessed 21/12/18 http://www.peterb.dmu.ac.uk/maxClatter.html)

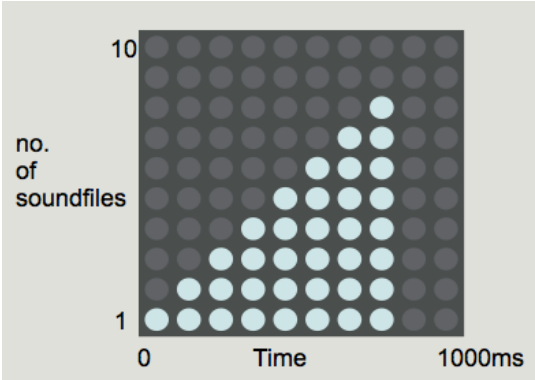

Figure 8. Short soundfile distribution using the Max/MSP matrixctrl object across a 1000ms duration. This distribution denotes an inverse attack/crescendo shape.

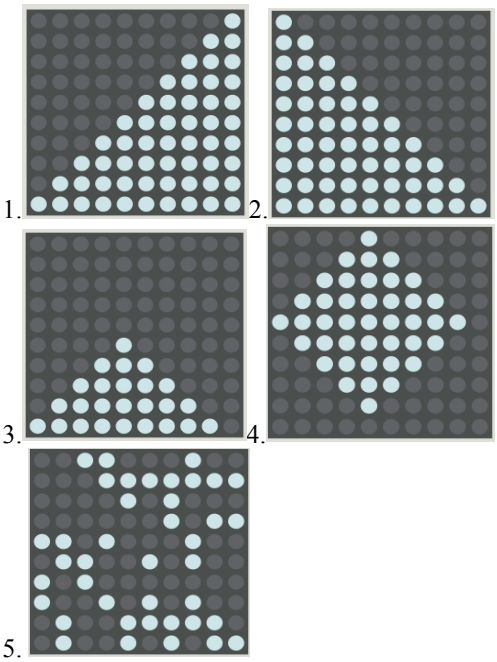

Figure 9. Creating distributions of short sounds using visual sound-shapes as templates for clustering in Max/MSP (matrixctrl object). 1. Inverse attack, 2. Attack-decay, 3. Parabola ramp up/ramp down, 4. Emergence-disappearance, 5. Random distribution.

The organisation of multiple sounds within the matrix is flexible in terms of its timeframe and number of sounds allowed into the patch. The above images demonstrate space for 100 soundfiles, but matrixctrl object may be expanded for larger folders and the shapes can be loaded as presets or re-designed for bespoke configurations. This system allows sounds to be triggered in the sequence determined by the present shapes over a specified timeframe. Exploring different shape configurations for sound clustering has enabled development of the visual sound-shapes compositional method (Blackburn, 2011) now demonstrating how composite structures can be formed via short materials.

4.7 Morphological stringing with short sounds

A further way the visual sound-shapes methodology has evolved to cater for short soundfile clustering is via an adapted form of morphological stringing[8]. In traditional morphological stringing, onset – continuant – termination sound units join together so that terminations become the onsets for the next unit (Figure 10).

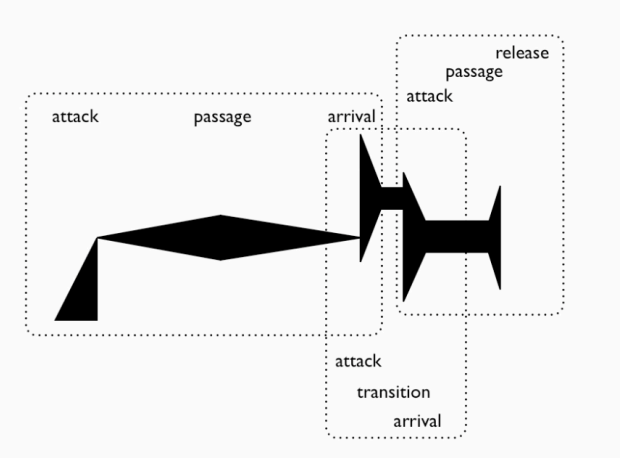

Figure 10. Morphological string comprised of seven sounds occurring in a 30s time frame.

Stringing short sounds together in this way to create longer materials has one very distinct difference to traditional morphological stringing; due to brevity, the continuation (middle) component belonging to the usual *onset, continuation, termination* model[9] is not observable. Its existence is too brief too notice. Brevity itself detracts away from continuants since attention is drawn to how something starts (onset) and how it ends (termination). A continuant exists, but for a bare minimum, often preventing its identification.

5.0 Results of working with brevity

Working with brevity has certainly resulted in a production of detail regarding my musical outputs. This refined, yet painstaking way of working relying on a greater number of materials occurring at any one time produces a rather playful result, with a defined sense of phrasing since assemblage and clustering becomes more intense at 'cadential' moments. This behaviour complies with audience expectation and anticipation, developing a particular trait or sound quality to my music. I believe that placing emphasis on this lower level detail pays off in the long term, enhancing the overall quality of a work. This process also places great value upon the starting quality of the sound recordings capturing the short materials – if these individual short sounds are captured with a good profile, this will continue throughout the whole compositional chain to the finalised work.

[8] "Sound units can be strung together to form longer phrase lengths called *morphological strings*" (Blackburn, 2011).

[9] Onset, continuation and termination (start middle and end) terminology are taken from Denis Smalley's descriptive aid known as Spectromorphology (1997).

5. CONCLUSIONS

This paper has presented a range of personalised techniques and strategies for working with large numbers of short sounds in fixed media compositions. The paper has demonstrated the value of collating many short sounds together and how an individual sound's insignificant, mundane and ordinary nature can be overcome through sound clustering. Manual and automated approaches have been considered along with the results of using fragmented audio as opposed to naturally short sounds.

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