TIM(br)E: Compositional approaches to FOG synthesis

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Abstract

A variety of compositional possibilities arising from FOG synthesis is discussed. The potential of FOG synthesis for creating new sounds and transformations is examined together with alternative ways in which these might be used in new compositional structures. The aesthetic implications of these various approaches are explored. This investigation results from the author’s own compositional work and musical examples are used to illustrate the paper.

1. Introduction

The theoretical and historical background to FOG synthesis has already been described at length elsewhere (Clarke, Manning, Berry and Pervis 1988; Eccel, Jutand and Becker 1995; Clarke 1996). This paper explores the compositional issues that arise when using FOG synthesis. Briefly, the FOG algorithm takes the grain envelope used in FOF synthesis (Rodet, Potard and Barrière 1994) and applies it not just to a synthesised sine wave but to any stored waveform, normally one derived from a recorded sound file. In this it has similarities to the granulógenesis of sound files by Barry Truax (Truax, 1994) and others, but with the particular characteristics of FOG synthesis, most significantly the local envelope. This envelope, together with the precise timing of grains offers the composer much greater control over the spectral results of processing, enabling more effective movement between the time and frequency domains.

FOG synthesis has been implemented by the author as an additional unit-generator for Csound and by Gerhard Eckel in smax/FTS.

2. Time and Timbre

As with any algorithm, FOG can be used in many different ways but this paper is concerned with the particular issues that arise when certain distinctive aspects of FOG synthesis come into play. As a form of granular synthesis FOG synthesis can be used to shape the distribution of grains in time. However, it is also a form of FOG synthesis and therefore permits detailed control over the frequency domain. The hybrid nature of the algorithm enables composers to move the focus of their attention between the time and frequency domains, between texture and timbre. This introduces interesting possibilities but it also raises aesthetic questions about how such music can be meaningfully shaped and structured. Many of these issues apply equally to synthesis based on sine waves (FOF) and to the granulógenesis of recorded samples (FOG). In this paper, therefore, the term FOG will be used to apply to both these methods and the sound examples used to illustrate this paper will demonstrate both techniques.

3. Transformations

Within FOG synthesis the distinction between timbre and texture becomes blurred. A unified timbre can dissolve and become a complex diffuse texture and...
then reform as a timbre. This can be achieved both with FOG synthesis based on a sine wave (sound example), and with FOG transformation of a sound file (sound example). Such gestures might well be used as transformations within the context of a composition in which musical objects are relatively clearly defined and unambiguous. However, it is also possible to conceive of such processes on a larger scale, the musical material as a sea of grains, some of which at times coalesce for a while to form timbral objects before diversifying once again (sound example). In such a context musical objects, whether notes, timbres, motifs or gestures become a temporary configuration within a transformational process rather than the main focus of attention. Temporal events emerge seamlessly out of timbres and vice versa. Identity becomes fluid, an element of one timbre breaking away to become part of another later (sound example).

4. Compositional implications

Working with such techniques can require a change of approach from the composer. On a practical level an example of this can be illustrated by considering the ways in which a composer might approach the composition through Csound. Often Csound instruments are used to create timbres which are then articulated by notes in the score file. The parallel between traditional instrumental composition and Csound treated in this literal way is such that composers need not necessarily change their compositional strategy very significantly: composition is still about organizing notes into structures. The main difference is that in creating the orchestra file the composer is harnessing the design of the instruments that will play these notes. Working with FOG synthesis, however, can easily lead to the dissolution of this model. Csound ‘notes’ may no longer represent single pitches/durations in the normal sense but rather complex events or textures which in some circumstances may last for several minutes. Such instruments are no longer generators of single notes but instead models for transformations. In composing, therefore, the composer is first of all creating transformational gestures through the ‘orchestra’ file and then otsubbing these into a structured whole using the ‘score’ file. In itself this way of working is not so different from that of much electroacoustic music, especially that derived from transformations of recordings of concrete sounds. Less common is the possibility that is provided by FOG synthesis of moving between such textures on the one hand and timbres on the other. The orch and score no longer have fixed roles; the orchestra can generate textures or timbres, and the score assemble notes or gestures. Significantly, these roles can change quite fluidly.

5. Aesthetic implications

There is a variety of ways in which these possibilities can be employed compositionally. Some have little new aesthetic significance, others require a more radical rethinking. At one extreme, for example, the movement between timbres and texture can be used as little more than a decoration of a traditional musical object, a note. Rather as an ornament decorates a particular pitch so a relatively brief transformation can help articulate a timbre (sound example). Somewhat more adventurously transformations may become musical events in their own right. Their primary function nonetheless may still be to lead from one musical object to another (sound example). Far more radical is the possibility, already suggested, of placing the emphasis on transformation rather than on object, or at least of changing the focus from one to the other during the course of a piece. Such possibilities can evoke exciting new imagery and are perhaps reminiscent of scientific theories about the interconnectedness of matter. Ambiguity can be played with as one timbre merges into another (sound example). Metaphically the blurring of identity risks eroding the very basis of traditional musical structure. At least superficially a comparison might be made with minimalist music in which process is all important. However, the
processes in this case work from a lower level, not with notes but with grains (which can at times form notes).

Such an approach raises new challenges for the composer. How can such material be given shape and structure on a larger scale? There is, for example, a danger that if identities become blurred transformations lose their power. Perhaps it is only by first establishing distinct identities that a movement between them gains significance and meaning. Alternatively, it might be argued that this new approach implies a very different aesthetic in which dialectic is replaced by unity.

One approach to this problem is to make the amount of change, the degree of stability or transformation, itself a parameter of the musical structure. Moments of arrival and stability at particular timbres or textures become goals for the music. The rate at which the direction of transformation changes can then be a major factor in determining the listener's perception of tempo. Rapid, disjointed transformations which increase tension may give way to slower more sustained evolutions. The index of metrical tempo has moved to a higher order, not stasis or change in itself but, since the music is a continuous process of transformation, stasis or change in the rate of change.

6. Conclusions

Different composers will approach new techniques such as FOG synthesis in different ways. Some will use them to augment existing techniques, maintaining their existing aesthetic stance. Others may take on the challenge of a radically new music. FOG synthesis offers many alternatives and composers using a face intriguing choices. It is to be hoped that many composers will take up this opportunity and choose a variety of approaches. Only in this way will the full breadth of potential of this technique be explored and its musical significance fully developed.

References


