STRUCTURING MUSIC FOR ANY SOURCES

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ABSTRACT

This article describes an interactive notation paradigm, which aids in structuring flexible performances for an arbitrary number of participants and any combination of acoustic or electronic sources. A simple system allows a 'maestro' to organise an ensemble and to communicate information to the members by means of an interactive window projected on a surface visible to all (performers and audience). The following text describes the motivation and design of the notation strategy, its implementation in the SuperCollider environment and discusses some compositional, performative and pedagogical issues with reference to a recent work; in this context the 'system' is considered to be the 'piece' itself.

1. NON-STANDARD NOTATION

Musical pieces that are open to multiple interpretations and invite performers to realise them within a field of possibilities have been common especially since the 1950s [1]. The idea is quite tempting for composers and entails the construction not of a definite artwork but of a framework (an open work) within which creative synergies can flourish [2] and unexpected musical relationships can be brought to life by injecting indeterminacy in structural aspects of the musical work, thus generating flexible pieces which are different with every performance.

The ambiguity and uncertainty in fundamental structural parameters that many open works demonstrate, easily blur the boundaries between guided improvisation and composition. What is often of particular interest for a composer of new music is to find the appropriate notation strategy in order to strike a working balance between control and chance, such that the overall musical form is identifiable yet flexible, inviting multiple, and possibly equally valid, realisations of the piece. A common practice is to work with traditional notation to communicate somewhat fixed harmonic, melodic and rhythmic structures (when needed) and to utilise some kind of graphic or verbal notation for the elements requiring a more flexible level of control. An interesting approach involves the use of animated notation, a music notation 'that engages the dynamic characteristics of screen media' [3]; a range of software tools already exists, developed for the design of interactive and dynamic scores, such as 'INScore' [4] for example.

Viewed from a composer's perspective the use of non-traditional notation techniques enables the creation of complex and interactive works which would be difficult to produce otherwise. It always depends on what are the principal aspects of the musical work at stake. If pitch precision and accurate timing are of primary importance then adopting western-standard notation seems to be an adequate choice; whereas, if sound texture, spontaneity and immediacy are the predominant elements of the composition then using some kind of graphic notation has proven to be helpful.

That composition may not be an object but a process [5], that a musical score can be flexible and thought of as a set of possibilities and not as a definite closed system, that there is no single realisation of the composer's intention, that a piece of music can be brought to life in a collaborative fashion inviting the performers' intuition, that chance and spontaneity can spice up a performance... are all well established and widely adopted functional ideas. There is a substantial body of work that exemplifies the benefits of incorporating non-standard notation schemas in contemporary music practice, not without a critique though.

Despite the innovative qualities of many graphic (or verbal) notation systems, very few open works manage to create a unified soundworld consistent with the initial score. Sometimes it is quite difficult to 'discern how the performer's interpretation might correspond to the intention of the composer' [6] (if such thing is an issue). Some contemporary pieces with open form seem to primarily have a therapeutic value for the musicians themselves (which is by no means a negligible factor); in other words, the performers are not unlikely to have more fun playing the piece than the audience experiencing it.

Apart from all the things that make graphic scores attractive, there is one that often receives less attention: Graphic -and especially verbal- scores can be constructed by untrained composers and can be somehow interpreted by inexperienced musicians. This is an important feature since they can function as an entry point for kids, students or amateur musicians to the incomprehensible field of 'art-music', for lack of a better term. Occasionally they offer a convenient way for someone to hide an inadequacy with notes, the western musical notation system that requires considerable effort and time to master and use effectively. Hence, using symbols and words an artist will be able to come up with a piece by defining the relationships between the involved parts, not the content per se - even '…just short of producing nothing at all' as Earle Brown (1999, p. 49) had put it- if he justifies that a particular set of instructions and symbols prepared before-

hand should constitute a composition at the semantic level[1]. This approach is less prejudiced and has far more freedom and ambiguity[2].

2. ACADEMIC ENSEMBLES VS BEAT

We now turn to look at how working with alternative notation strategies can be beneficial within an academic environment.

New music ensembles inside the academia tend to be difficult to manage. Often they run as extra curriculum activities and participant numbers are likely to vary widely from one rehearsal to the next. Depending on each Department's general philosophy, cultural and aesthetic trends, students may come from different backgrounds and demonstrate various levels of musical proficiency. There are few things a coordinator can take for granted at the first meeting and throughout the semester, while leading the group to an open recital at the end of the year.

As expected, many students come to the ensemble with their own ideas as to what (new) music is. Some will judge experimental music in normative terms (if it sounds 'good' or 'bad', as opposed to 'what is it good for') and sometimes their preconceptions on contemporary music and lack of exposure to organised sound make them 'resistant to both new concepts of composition and of music, and to new roles for performers and audience members' [7]. Generally speaking, student engagement is a multifaceted subject that relates to pedagogical issues that have been explored elsewhere[3].

An important aspect in running a functional new music group (a laptop ensemble, a live-electronics group, etc.) is to pay attention to the music itself. Many ensembles have a tendency to explore works and construct performances where fundamental aspects of the music the students have come to appreciate are absent. To the students' ears there may be little melody, harmony and rhythm in the music they are asked to dive in, since the aim is usually to investigate new methods of organising the musical material and to explore foremost timbre, texture and space often at the expense of other qualities. Hence the soundworld might seem fairly peculiar to them that some novices could loose interest. What we are primarily missing, is *pulse*.

Pulse is a sufficient ingredient to infuse cohesion in the musical structure, keeping musicians and listeners engaged and it does not become outdated. It is a means to create perceivable patterns in the temporal flux and should not be confused with *beat* (a metrical pulse) which is often absent from avant-garde. One could think of it as *recurring vibrations*, which are somehow perceived as not being independent from each other.

A misconception, which exists amongst students, is that pulse is equivalent to organising beats to patterns (measures) at a constant tempo. Since digital tools allow for the creation of identical clones of the original music material to be sequenced one after another with time accuracy, it is easy to construct carbon-copy unimaginative rhythmic patterns without variation inside the computer. What is needed is a means to get students to start thinking of rhythm not as a pattern of attacks constrained by meter, but as a configuration of movement in time.

Pulse is closely bound to human existence (like breathing, heartbeat, seasons, etc.). It is a notion we can always return to to draw parallels to contemporary music concepts in order to demonstrate how relevant some ideas can be even if on the surface they appear alien.

It is helpful to remember that … we remember what we understand, we understand what we pay attention to and we pay attention to what we want [8], [9]; hence students can be indulged in new music and spend time to appreciate its qualities if they participate in something they feel is relevant to their past musical experience[4], which is inevitably *beat*-oriented due to overexposure to popular music. Embracing *pulse* may be a means to do this.

3. RADAR

The previous paragraphs touched upon few different aspects of non-standard notation and scratched the surface of how it is to make music with unconventional student ensembles; the issues raised provided the motivation for composing RADAR[5], a work which makes use of a real-time animated score implemented in the SuperCollider (v.3.12) language.

3.1 Design

The main concern for building a simple interactive notation system was to find a way to structure a piece of music for an ensemble of variable size and for any combination of acoustic or electronic sources whose members demonstrate different levels of musical proficiency, as happens in real life with off-curriculum ensembles in some Universities. The layout had to be clear, making use

[1] The Harvard Dictionary of Music (2003) defines composition as 'an activity carried out prior to the performance or a work whose features are specified in sufficient detail to retain its essential identity from one performance to another'; the term is often used in opposition to improvisation which involves 'the creation of music in the course of performance'. In the world of music this distinction is not at all clear and varies with time and place.

[2] Some composers who embrace open structures tend to invent notation strategies that welcome generative processes and collaborative practices in an effort to build a system that allows for anti-hierarchical relationships to evolve, such that the composer is not viewed as an authority but as a mediator for the musical performance to be realised through creative synergies. One possible paradox is that this anti-hierarchical stance, of trying to create a work without a master, is in contradiction with the very act of undersigning the final outcome, since as composers we are usually careful to attach our names to a score.

[3] See for example Organised Sound's vol.18 no.2 (2013) dedicated issue.

[4] Every year, in order to find out what kind of music students listen to, newcomers fill in a form jotting down "last year's most interesting piece". Accumulative data from multiple classes at different Music Technology courses over the years reveal that freshers have a tendency towards highly repetitive pulse-based music.

[5] The code is available from the project's webpage http://orestiskaramanlis.net/radar. It contains no external libraries and it is easy to modify by a somewhat amateur user of the language.

of elements that can be learnt in advance quickly, and which can be comprehended at a single glance during performance; the signs also had to be enough 'to avoid that the musicians shift into "improvisation"' [10]. Of particular interest was the design to facilitate the creation of rhythmic and polyrhythmic structures by locking the members of the ensemble at different tempi, in such a way that the recurring attacks create unexpected textures of pulse-based material.

RADAR allows a single user 'the maestro' to organise an ensemble and to communicate information to the members by means of an interactive window (a coloured disc) projected on a surface visible to all, performers and audience; thus inviting the listeners 'to discover or decode the relationships that exist between sound and score in a way that they are normally unable to', if this is desirable [6].

The ensemble is initially divided into groups, with each group represented as a disc sector (a 'pizza slice' corresponding to the region on the disc which is bounded by 2 radii). Any number of performers is feasible, but an ensemble of more than 20 will clutter the animated score making it difficult to read on the fly. Homocentric circles may define sound-event categories, which could be notes, tones, whole musical phrases, vamps, sound-objects, etc. A black dot on the disc's surface denotes a sound-event to be played by the respective performer (or group of performers). An arm spinning around the disc keeps all performers in sync. When the arm intersects with a dot, the respective performer(s) play a sound. If the ensemble is comprised of pitched acoustic instruments, a dot could be thought to correspond to a note from a particular scale as defined by the number of homocentric circles. Multiple spinning arms allow the maestro to create polyrhythmic structures. The faster an arm spins, the faster the tempo.

The ensemble can collectively decide on all aspects of the performing strategy beforehand. For example, a larger dot may denote a higher dynamic or an embellishment; a rotating grey wedge may be a cue for improvisation or for sustaining a sound, and so on.

The maestro has control over the temporal flow of the piece by adding, modifying and deleting sound-event marks, changing the tempi, altering the number of groups and the number of sound-event categories. Even though the system employs a 'hierarchical' top-down approach for the organisation of the musical material during performance, there is plenty of room for the ensemble's intuition and creative input to unfold during rehearsals. The participants can decide collectively on the exact performing strategy, which would accommodate individual idiosyncrasies and skills, hopefully yielding a piece which is enjoyable to play for the available forces.

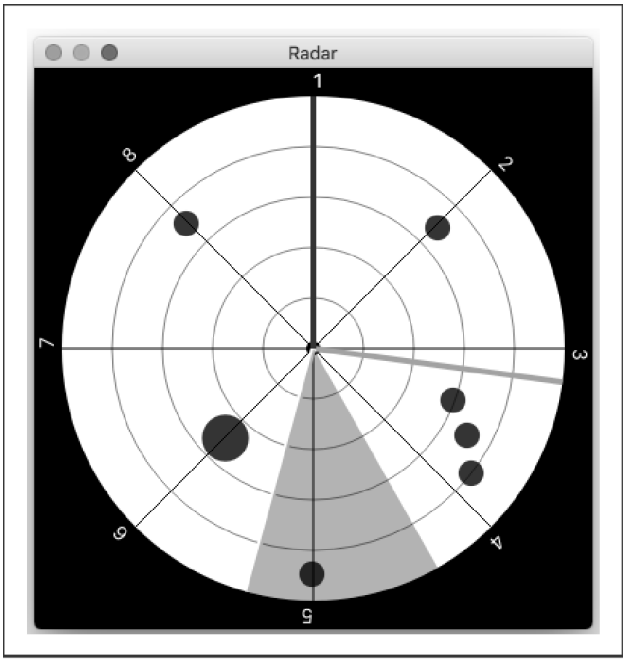

Figure 1. A RADAR window. Black dots denote sound-events, disc sectors bounded by 2 radii define performer groups, homocentric circles define sound-event categories.

3.2 Performance

RADAR premiered by a displaced and mixed 12 member ensemble (playing instruments and electronics), all students at the Universities of Oslo and Athens, at Ultima Festival in Oslo, Norway[6]. The group worked together to decide on the performing methodology prior to the performance, which at the end comprised of few distinct parts, incorporating guided improvisation sections, dense textures, polyrhythms and explicit motivic passages. The *piece* is the *system*, and in this context RADAR is just one realization of the many possible outcomes that can be produced from the same real-time animated score.

In order to achieve a seamless musical flow during performance the piece was organised in *cues* (individual sections) utilising the CuePlayer [11], a SuperCollider library [12] useful for executing processes organised into an array and triggered one after another during the course of the piece; this tool provided a means to shape the music macroscopically and to create in advance an identifiable overall form, with beginning, middle and end.

3.3 Evaluation

Anonymous responses were collected from the performers who were asked to rate their overall experience with the system. The majority felt that the notation strategy was clear and easy to learn and interpret. The responses seemed to be on the positive side -however more mixed-

[6] The performance was part of the 'transmissions' project, coordinated by Onassis Stegi (Greece) in partnership with Ultima Oslo Contemporary Music Festival (Norway) with the support of the EEA Grants and the Norwegian Financial Mechanisms 2014–2021.

as to whether the notation provided adequate information to the performer. Possible drawbacks of the system related to the ambiguity of the sound-world produced, executive issues on performing with accuracy at fast tempi, and lack of communicating expression markings, (the expressiveness was left at the performer's discretion and relied foremost at the discussions in advance). Using multiple colours and more symbols might have added an additional layer of complexity, increasing the communicative power of the system. One participant observed that the design allows someone to *live compose* a piece as opposed to *improvise* it; in both scenarios the music is created on the spot, but in the first instance there is significant amount of precomposed material prepared beforehand tailored to suit a specific group.

4. EXIT

RADAR draws ideas from various real-time animated notation efforts[7] that have been used by electronic music ensembles and laptop orchestras in the academia. It is a simple yet functional implementation, hopefully providing a framework for trained and untrained musicians of any age to play along under a shared pulse. The piece is the system.

Acknowledgments

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