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# ALGORITHMIC MUSIC FOR HUMANS: PROCEDURAL AND FUNCTIONAL THINKING IN STRUCTURED IMPROVISATION AND THE DEVELOPMENT OF HUMAN-READABLE PSEUDO-CODE

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February 24, 2020

## 1 Abstract

In his essay “Stockhausen today and tomorrow”[1] composer Richard Barrett outlines what he believes to be applications of integral serialism to structured improvisation (what Stockhausen called “intuitive music”) in the series *Aus den Sieben Tagen* (of the Seven Days)[3]. This somewhat well-known series of text instructions, poetically formed, give suggestions for sounding (or non-sounding) activity in an ensemble context. Barrett points out that this follows Stockhausen’s use of serial technique (expanded on below). In my doctoral thesis[2] I took Barrett’s observations of *Aus den Sieben Tagen* and applied them to Barrett’s own *codex* series of structured improvisational pieces, particularly in the analysis of form. This area of interest, combined with basic explorations of SuperCollider, led me to the observation that, generally speaking we think of algorithmic composition as something primarily in the domain of computers, or if not computers, then at least electronics such as modular synthesisers. These ideas are explored in the research project of Hans-Holger Rutz and David Pirrò *Algorithms that matter* to be finalised in the 2020 xCoAx conference[4]. My series of pieces formerly titled *Logarithm*, revised in 2020 to *thread* attempts to apply code-based sequential logic and a pseudo-code syntax to ensemble contexts as propositions or provocations for seeded improvisation. This paper explores the the Barrett-Stockhausen observation of serial thinking in structured improvisation, giving a brief overview of some of these practices while positing that they act as algorithmic procedural instructions. This also includes some of my own work, in particular the *threads* series.

Barrett[1] defines three aspects of serial thinking drawing on Stockhausen, separate from, though not unrelated to, Stockhausen’s processes of integral serialism and formula composition. They are:

- (a) identifying the parameters which are to be the focus of a composition, the “dimensions” in which it will exist;
- (b) assigning minimum and maximum values to these parameters and in doing so establishing a “space” with those dimensions;
- (c) making musically-significant movements across those parametric dimensions, or to put it another way, making a journey of discovery through the space they create.

This mode of thinking applies to my own *threads* series, for example, in the first (prototype, premiered at Tilde New Music Festival 2015) the score is:

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music.function x = (x-x2)+(y+y3);  
music.function.DoUntil;  
music.function x = x+1 ;
```

This is syntactically poor, and mathematically silly, but that is not the point. It acts as a provocation for improvisation while providing an (open) temporal frame. Relating this back to Barrett’s thoughts on serial thinking: this provocation defines a: the parameters (x

and y), plus the “end”, b: the minimum and maximum values (determined by the performer as to the meaning of x and y), and c: allows musically significant movement across these dimensions, through ambiguous mathematical suggestion. It also provides a suggested *order* in which to perform various intuitive “calculations”.

The rest of this paper will contain analyses of newer works in the series, examples of selected other works, including *Aus den sieben tagen*, and personal reflections on the performance of a new set of works in the *threads* series.

## 2 Supporting Material

Not Applicable

## 3 Bio

Vincent Giles is a composer and producer of exploratory music, discovering new ways to do creative things for human experiences. As a composer, he works with acoustic and electronic sound in the context of concert music, electronic music, installation, and improvised performance that is inspired by code, the natural world, mathematics, and science. These works are best described as experimental, being the result of emergent processes. He utilises traditional notation, graphics, computers, interactivity, custom instruments, and is interested in machine learning and other forms of artificial intelligence as part of his computer-assisted musical practice. Together with sound artist Alice Bennett, Vincent founded Tilde New Music and Sound Art Inc., an organisation dedicated to the promotion and support of contemporary art music and related practices of our time. He is the current Vice-President and Treasurer of the organisation. He is also the former co-Director, Manager, and co-Producer of the Tilde New Music Festival and Academy events. Vincent is a lecturer in Composition and Music Production at the Australian Institute of Music. He has previously been employed as a lecturer in Critical Studies at Collarts, and as a Teaching Associate in Composition at Monash University.

## References

- [1] Richard Barrett. Stockhausen today and tomorrow. *Stockhausen—A Festival of Light, University of Birmingham/Birmingham Conservatoire/mac Birmingham (20 August)*. Revised version of text published online at <http://richardbarrettmusic.com/Stockhausen2012.html>, 2012.
- [2] Vincent Giles. *Microsound, spectra, and objectivity: tracing memetics in organised sound*. PhD thesis, University of Melbourne, 2016.
- [3] Karlheinz Stockhausen, Diego Masson, and Paris Ensemble Musique Vivante. *Aus den sieben Tagen*. Harmonia mundi, 1988.
- [4] Mario Verdicchio, Miguel Carvalhais, Luisa Ribas, and André Rangel. xcoax 2020: Proceedings of the eighth conference on computation, communication, aesthetics & x. 2020.