



comma

A system for probabilistic collective musical creation

Some 20th-century music has focused on the production of sound masses, based on processes that are more statistical than precisely written.

This approach interests us because it can generate a new form of musical practice, of collective creation, which illustrates our fascination for the organization of natural systems. We'll be moving more towards phenomena evoking the waking up of birds, than towards productions derived from the rhythmic organizational constraints of symphonic music.

Comma represents a different experience for everyone, regardless of musical background. In this, amateur and professional musicians are on an equal footing, each having just as much to do to achieve the concert result.

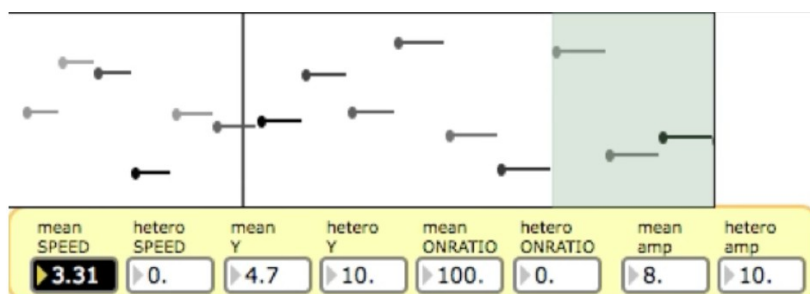
The finalization of a musical composition with this system is not a fixed score: the information to be read by the performer is in fact generated at the moment of performance.

This immediacy, this urgency, has one consequence: the attention paid to reading is no longer simply a matter of deciphering, but of interpreting. The performer is always immersed in the conditions of "the first time", at the crossroads between several beams of information: that of the direction given by the composer, that of the overall sound, that of the instructions updated at every moment, with which one must "com-pose".

Comma takes a fresh look at several aspects of musical production:

- Using musical notation that reflects the idea of unfixed time, with its elastic properties.
- Integrating improvisation into the compositional framework;
- The symphony is now a mass of sound, a sum of isolated contributions that are statistically derived;
- Spatialization: possibility of managing musicians who are far away or out of sight, in fragmented arrangements.

On the Performers' Side: How it works



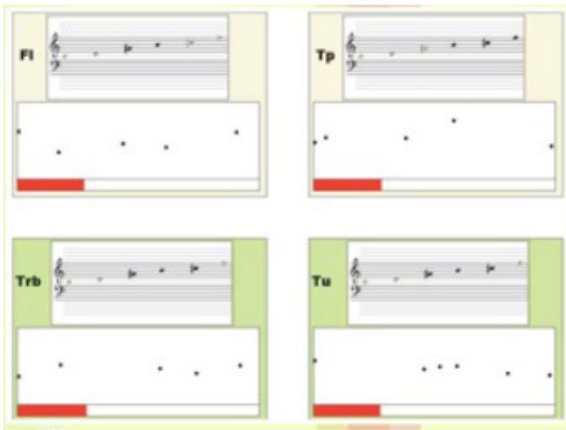
The computer displays musical information on screen: pitch, intensity, rhythm, timbre.

A population of sound-icons moves from right to left on the monitor.

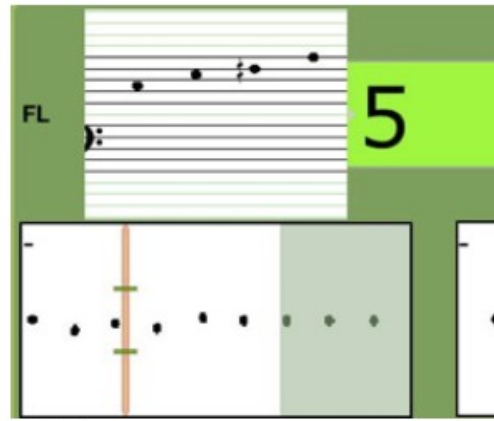
When the head of a tone icon reaches the vertical bar, the note is played, respecting its length.

In this version, intensity is described by the levels of gray: the paler the icon-sound, the weaker it is. An option, depending on the level and instrument, is to select a note from a reservoir displayed in addition to this window. All this information is produced by an algorithm that translates, in real time, the evolution of random parameters previously written in a kind of meta-score. It is this score, among other things, that gives the work its shape.

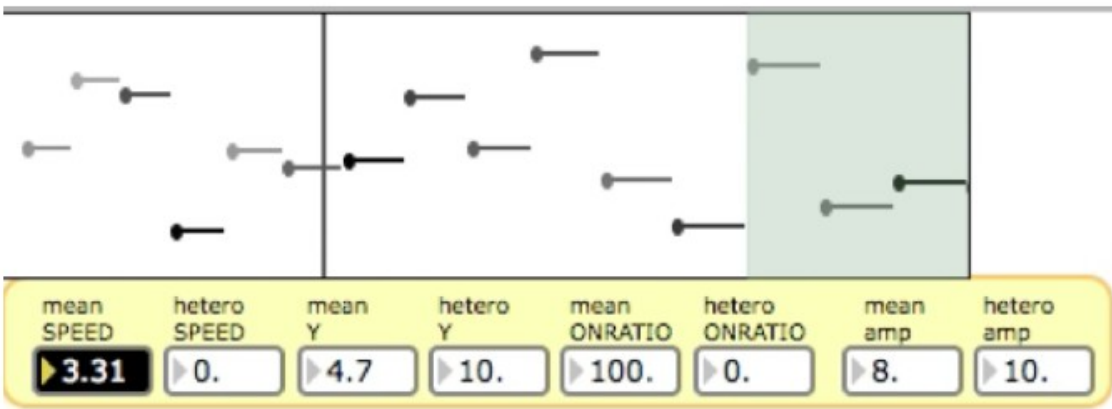
Evolution of the interface



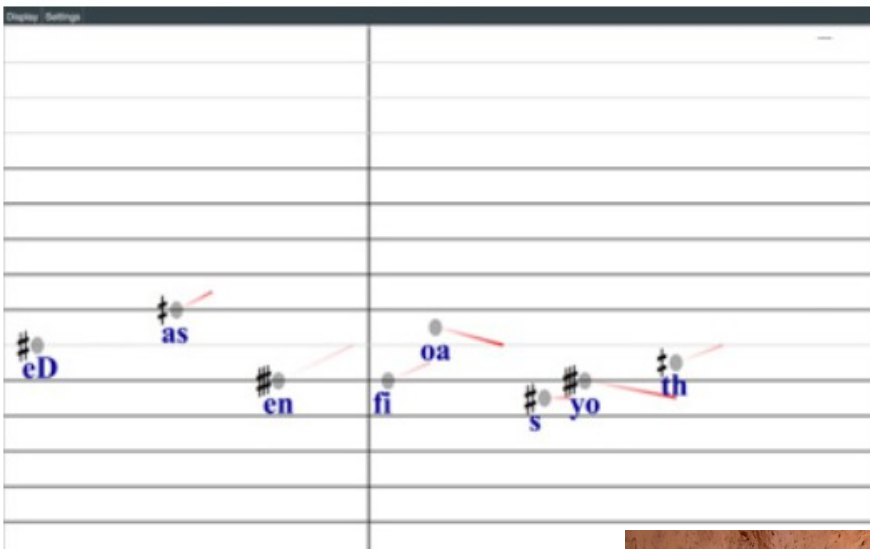
2007



2009



2012



2018



Comma in a troglodytic church.

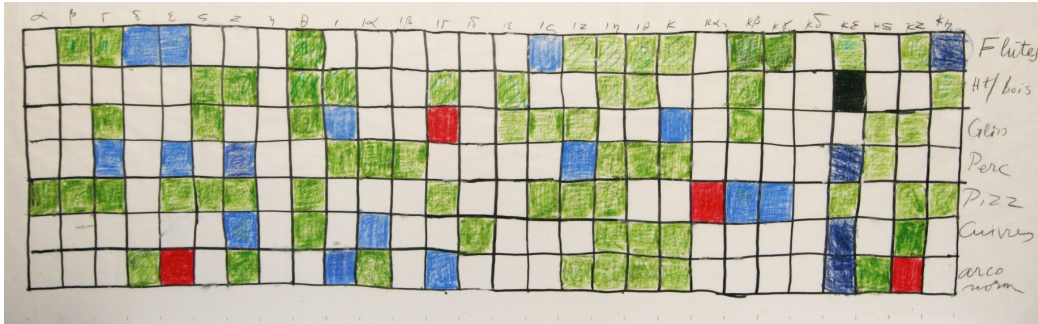
From the Composer's point of view: Meta-scores

The meta-score describes the evolution of parameters over time.

We call them parameters because, rather than giving exact values for pitch, rhythm and intensity, a first curve specifies the "central value", the most likely one.

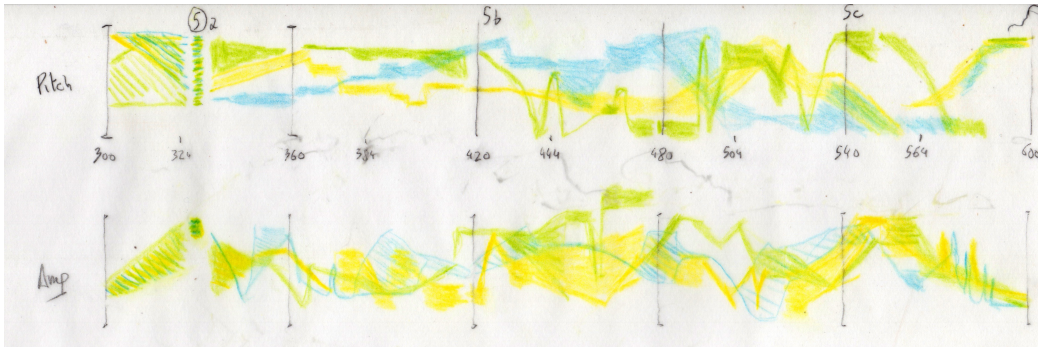
This is followed by another curve, which determines by how much the values finally generated will be allowed to deviate from the previous central value.

With Xenakis, the succession of probabilistic parameters was generally done using matrices, i.e., we moved from one section to the next by making a jump in the parameter:

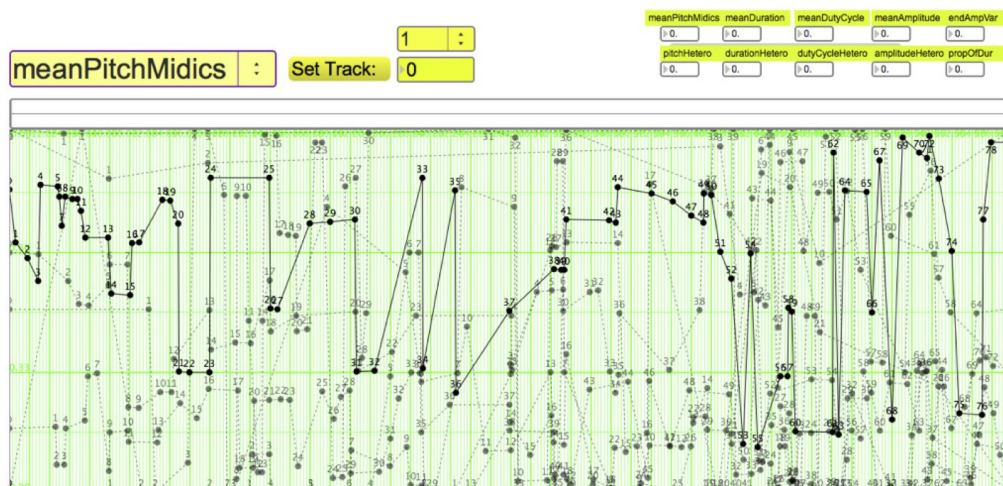


Achorripsis matrix by I. Xenakis with time on the x-axis

What we propose is to control these parameters graphically, so that their evolution can be continuous:



Excerpt from a three-voice meta-score by R. Bourotte

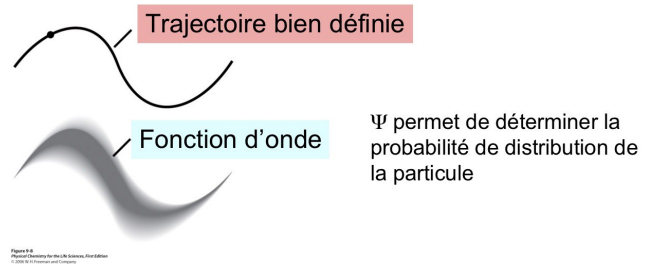


The previous meta-score once entered into Max/MSP

Les fonctions d'onde

Soit $\Psi(x,y,z,t)$ la fonction d'onde associée à une particule unique non relativiste (vitesse très inférieure à la vitesse de la lumière) Ψ est un **modèle mathématique**, sans signification physique, non déterminable physiquement

In the near future, composition will be made simpler by the use of a probabilistic graphic sequencer, which will allow us to describe both the mean and the deviation with a single brushstroke, like the image opposite:



Extract from a slide show on quantum physics¹³ by Françoise Winnik (Université de Montréal)

Pedagogical aspects

The pedagogical and the artistic are intertwined:

- the continuum, which is hardly part of the classical curriculum, is approached as a real musical possibility, in terms of both rhythm and pitch;
- a symphony can be produced without chaos, since predefined, non-arbitrary intentions and directions are respected;
- rather than devoting a great deal of editing time to rhythmic accuracy, we concentrate on how to produce an overall sound;
- a wide variety of sound production methods can be used in this system (objects, classical or electronic instruments, voice, etc.).

Technical requirements

A video projector can be used for concerts and rehearsals. Each sub-group in the orchestra will be assigned a particular area of this projection for "deciphering".

We can also make use of participants' phones or tablets (iOS).

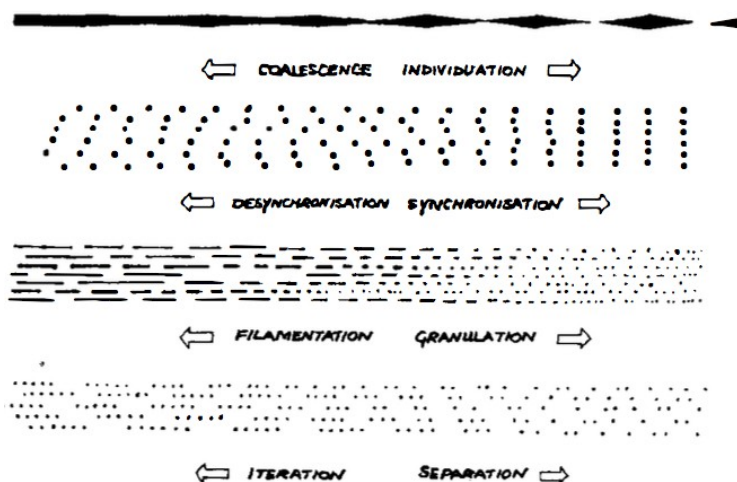


Figure 9.5 Change of regime in continuous streams.

Some typologies of music production that correspond to the Comma model, as illustrated by Trevor Wishart in his book "On Sonic Art", p. 187.