

## **Programme: Music, Time and Programs.**

**10h30 – 11h30:** Martin Carlé, *Accessing the Turing-completeness of Ancient Greek music theory by means of literate programming*

Theoretically accounting for the ‘new music’ arising during the classical period and for its melodic characteristic to employ frequent, time-wise extended and ever more breakneck modulations, Aristoxenus of Tarentum, a pupil of Aristotle, expanded the scope of harmonic science to encompass a concept of musical understanding (ξύ νεσις) that asks the listener to integrate over the temporal unfolding of melody as potentially forking processes that traverse through a set of 12 ‘keys’.

Contrary, however, to the modern understanding of Aristoxenian theory as if already aiming at a closed circle of fifths (like this is imposed by the demands of polyphonic modulating music and, as a consequence, is forcing to detune all intervals equally badly as to fit into one octave or 12 pitch classes) the trajectory of pitches as resulting from a modulating just-(in-time)-tuned progression of monophonic melodic intervals has rather to be conceived as moving through the power space of all possible harmonic relations as determined by the Aristoxenean set of 12 double octaves. Accordingly, the topology of the respective pitch space takes the form of infinite spirals.

Accessing the Turing-completeness of ancient Greek melodies as theorized by Aristoxenus thus means to create a procedural mapping between, on the one hand, the 12 possible states of harmonic keys taking the role of Turing’s read/write head and, on the other hand, the given infinite pitch space as to function as Turing’s infinite tape. As a first step to achieve such a mapping, the historically rather well traceable procedures of Greek melodic modulations shall be encoded by functional closures operating on both, harmonic states and pitch space. Consequentially, the actual melodic unfolding is to be regarded as performing the steps of a program that shall be visually and acoustically displayed by help of diagrammatic representations of tonal systems as they are described in ancient treatises and as they were forming the authentic epistemological devices (or ‘paper machinery’) leading to Aristoxenus’ theory.

The talk will make heavy use of advanced literate programming techniques freely available by Emacs’ org-mode and an especially written SuperCollider extension for org-babel in order (i) to demonstrate the described approach and (ii) to generally reflect upon the employed means from a technological, methodological and educational perspective. Time-wise an equal balance between the former (i) and the latter (ii) shall be sought.

**11h30-11h45:** Pause

**11h45-12h45** Jean-Louis Giavitto, *Time, timelines, cuelists and clotheslines in mixed music*

The term mixed music refers to musical works that combine classical instruments and electronic sounds. Mixed music renews musical problems, in particular those related to music as a performance and musical performance as a collective process.

The first point refers to the distinction between a score and its interpretation. Unlike a computer program and its mechanical execution, a score leaves a space of freedom to the performer whose choices will complete, refine and transmit the meanings of the musical material. These choices are guided by instrumental practice, history and musical culture, but also because music is played by humans and the collective dynamics greatly influence these performance decisions.

The computer does not have these cultural references. Is it then possible for it to interpret an electronic score in accordance with the musicians' performance?

Our presentation will focus on the temporal aspect of the musical performance : how to reconcile and tune the time of man and the time of the machine in mixed music. We will build on the results of the Antescofo system used at IRCAM to implement several mixed music pieces. At the core of the Antescofo system, lies a very rich dynamic and interactive

representation of time, which is organized like a clothesline with singular events (the clothespins) and elastic continuities between them.

**12h45-14h15:** Déjeuner

**14h15-15h15:** Mathieu Giraud, *L'informatique musicale est-elle de l'informatique ou de la musique ?*

L'informatique musicale rassemble une communauté vivante de chercheurs et d'enseignants-chercheurs, ingénieurs, artistes et pédagogues. Elle est par nature interdisciplinaire et met en jeu des recherches créatives comme scientifiques. Je détaillerai, d'un point de vue d'un informaticien, comment l'informatique musicale s'articule avec les concepts d'algorithme, de machine, de langage, et d'information proposés par Gilles Dowek. Je présenterai aussi des résultats préliminaires d'une cartographie du domaine en cours de réalisation par l'AFIM, Association Francophone d'Informatique Musicale.

**15h15-15h30:** Pause

**15h30-16h30:** Anthony Moore, "Hello, this is a sentence."

("this is a sentence which, by the time you reach its end, will have mostly disappeared...")

Time at the speed of sound; a rambling prose-poem spoken aloud to address "music time programs".

**16h30-17h00:** Pause de café

**17h00-18h00:** Julian Rohrer, *Liminal Time. Structure and logic of abstract situations.*

Algorithms and music share a liminal relation: structuring time from without, but nothing without time. This is not accidental – arguably, time is inherently liminal. In this talk I'd like to discuss how music and algorithms participate in this abstract and alienating kernel, and how the notion of program is affected by it.