

A general semiotic approach of time: toward a-media hypermedia documents.

Contributors: Philippe Bootz, Alice Daquet, Marcel Formosa, Marcel Frémiot, Xavier Hautbois, Jacques Mandelbrojt, Lucie Pro'dhomme, Charles Tijus

Abstract :

From 1991, researchers and composers at the Laboratory of Computer Music from Marseille (MIM) work on a new approach for music analysis based on listening: the temporal semiotic of music. Their approach is in continuity with Pierre Schaeffer's musical objects. They have found a set of 19 units they have called "temporal semiotic units". Morphology and semantics of these units were described in a book in 1996, which contains sound examples from different kinds of music. These units seem to be present in every type of music. In 2002, the MIM edited a CDROM that contains an analysis of 4 pieces from middle age to contemporary music.

The temporal semiotics by the MIM describes the musical sequences as equivalent to movements. It uses descriptors that are often concerned with space, velocity, energy, common characteristics of movement. In cognitive psychology, one of the most probable hypothesis on the treatment of time by the mind is that time is coded in spatial structures. So, the theory of UST is coherent with cognitive psychology knowledge: the UST could be valid structures in mind for time coding. Experiments by Charles Tijus and Alice Daguét, in the laboratory of cognitive psychology "cognition & usages" of the university Paris8 proved in 2004 that the UST exist as categories in mind.

In 2003, Philippe Bootz, an e-poet member of the MIM and researcher on hypermedia in the laboratory Paragraphe of the University Paris8, observes some elements of description of these units in the temporal behaviour of the visual in a multimedia work he was created with a composer of the MIM. To confirm the existence of UST in moving pictures, Xavier Hautbois, a musicologist from the laboratory IDEAC of the University Paris1 and Philippe Bootz made observations on works of experimental cinema and digital art. They seen a set of UST described by the MIM. Xavier Hautbois created in 2004 a video sequence of different UST by using moving structures.

In 2003, Philippe Bootz made the hypothesis that the UST are relatively media independent and that a new kind of artistic hypermedia is possible. He called "a-media hypermedia" This kind of hypermedia because it would be based on temporal processes and not on media. A particular temporal process, described in terms of UST, could be shown in a media or another in accordance with a temporal coherence and, sometime, "impression of morphing" from a media to another is possible in a single UST. We observed in the MIM that, in a certain context, a music seems to go out a moving picture. The hypothesis of the universality of the UST is based on the fact that the experiment of movement is not a musical experiment but an experiment of the body. The temporal structures based on a categorisation by the movement are made by the baby during the learning of movement and can certainly be extracted in any temporal event decoding. So, the problem of the UST is also a problem of biosemiotics that assures that meaning depends on the body and on the interrelation it has with its environment.

At the moment, a large domain of research is made in France on the UST. It includes researches in musicology, artistic hypermedia production, electronic literature, dance, painting, hypermedia theory, cognitive psychology, neurophysiology.

To use the UST in synthesis of hypermedia documents and not only in analysis, the morphological descriptors used by the MIM are not easy to use because they are qualitative, often specific to the musical vocabulary and cannot be implemented in a computer language.

It is why, in 2005, Xavier Hautbois and Philippe Bootz have constructed a model of “temporal motifs” by using the same method that the MIM. These motifs are new supplementary morphologic descriptors. They are characteristic graphical functions of time of the most relevant parameter of each UST. It seems that only 2 parameters are useful to consider: the volume and the melodic height of the sound. These motifs can also be extracted from the spectrum of the sounds. They can be programmed in order to construct temporal processes in UST.

The actual problem to translate these results in the domain of the visual is to determine the correct equivalence between sound parameters and visual parameters. A part of the solution was observed in June in the International Document Summer School when Kari Beate Tannberg, without knowing the theory of UST and these researches, extracted a specific UST from a picture by capturing its temporal motif and used it to generate a sound that had exactly the same temporal motif and was a pure UST. She translated an UST from a visual media to a sound media.

There are now many important questions without answer and the research in this field is at the beginning. But actual knowledge on this topic is sufficient to guide a research on new method of production of time-based hypermedia documents. Artists can greatly help the research because they instinctively know how to work with it.

We purpose to make an overview of the actual state of these researches: presentation of some UST, the temporal motifs, psychological validation results and the development of the model of braid that is the first graphical tool made to conceive time-based hypermedia documents. These theories will be illustrated with some examples in music, visual, literature.

Speaker : Philippe Bootz (alone coming at docam'05)
27 allée des Coquelicots, 59650 Villeneuve d'Ascq, France
motsvoir@free.fr

Mode of presentation : verbal and powerpoint. Examples in audio, video and programmed art. All element will be presented from my personal laptop.

Keyword : UST, semiotics, semantics, multimedia, art