

COURSE OF ACTION

Interactive Multimedia Installation

Pierre Schaeffer introduced the TARTYP (Tableau Récapitulatif de la Typologie) in 1966 as part of his typology of sound objects. The TARTYP plays a central role in Schaefferian theory, however, it is not widely accepted as a practical tool for musical analysis and composition. Its impracticality is in part attributed to the large number of confusing and vague terms introduced by Schaeffer in this table. ***Course of Action*** is an interactive multimedia installation that maps Schaefferian sound objects with dynamic images. It was created as part of an exploration of the practical applications of Schaefferian theory and the TARTYP in particular to real-time composition. The action in this installation is triggered by video-based detection of the spectator's motion in the room. The path of reaction is controlled by generative grammars which I developed based on Pierre Schaeffer's TARTYP (Summary Table of the Typology of Sound Objects). In previous works, I have used the TARTYP generative grammars for electroacoustic composition, audio-visual composition and computer improvisation.

The TARTYP is a schematic representation of a sound-object taxonomy (see Figure 1). In this table, time-domain terms appear along the upper row of the table and frequency-domain terms along the leftmost column. The intersections of columns and rows point to the sound objects notated (in alphanumeric notation) at the body of the table. For example the intersection of *impulse* and *complex pitch* points to the sound object X'. In addition Schaeffer divides the table into sub-collections of sound objects. Figure 2 displays this division of the TARTYP into six sub-collections. For example the nine sound objects at the center of the table are known to be the sub-collection of Balanced objects.

The TARTYP generative grammars are derived from the TARTYP classification and its terminology as well the structure of the table and its division into sub-collections. A set of rewrite rules in a TARTYP grammar generates large number of paths that could be composed out as sequences of sound objects. The TARTYP grammars are organized in a hierarchical structure that reflects the structure of the table. Each TARTYP grammar is associated with a sub-collection of the table. To incorporate the TARTYP Grammars in an interactive compositional tool, I have created the TARTYP Grammar Max Object, for Max/MSP and PD. A Grammar Object creates (in real time) a set of rules in one of the TARTYP grammars and then constructs (in real time) multiple paths from the same set of rules.

TARTYP Grammar Max Objects are incorporated as core elements in the software used in *Course of Action*. I have designed this software using Pd-extended and

Processing. The grammar objects generate rule sets and sound-object sequences in two compositional layers. In the first layer the generation of sequences is triggered independently by the software. In the second layer the generation of sequences is triggered by the capturing of the spectator's motion in the room. In addition, sound-object sequences are mapped to control the visual part of the installation. In particular, this mapping controls the selection of video clips, the selection of video effects and the generation of graphics.

		long duration (macro-objects) of no temporal unity		moderate duration temporal unity			long duration (macro-objects) of no temporal unity	
		unpredictable facture	nonexistent facture	short duration micro-objects			nonexistent facture	unpredictable facture
				formed sustain	impulse	formed iteration		
definite pitch	(En)	Hn	N	N'	N''	Zn	(An)	
fixed mass	SAMPLES (Ex)	Hx	X	X'	X''	Zx	ACCUMULATIONS (Ax)	
complex pitch			(Ey)	Tn Tx	Y	Y'	Y''	Zy
not very variable mass	(Ey)	Tn Tx	Y	Y'	Y''	Zy	(Ay)	
unpredictable variation of mass	E	T	W	φ	K	P	A	
			held sound			iterative sound		

Figure 1. Highlighted in gray are time-domain terms along the upper row of the table and the frequency-domain terms along the leftmost column in Pierre Schaeffer's TARTYP.

SAMPLES	(En)	Hn	N	N'	N''	Zn	(An)
	(Ex)	Hx	X	X'	X''	Zx	(Ax)
	(Ey)	Tn Tx	Y	Y'	Y''	Zy	(Ay)
			BALANCED				
			EXCENTRIC				
	E	T	W	φ	K	P	A

Figure 2. The division of the body of the TARTYP into sub-collections of sound-object classes.

The installation includes two computers: one for sound processing which is running a PD application and one for video and graphics processing which is running a Processing application. The communication between these two computers is done through a local Wi-Fi network. This installation is best presented in a semi-dark room with one to three bare walls. The video is intended to be project on the wall. A small room is preferred however the installation could be located in a portion of a larger room. If three bare walls are available, two projectors can be used with projection fields offset to the corners of the room (see Figure 3). Otherwise, one projector with centered projection field is used. Depending on the size of the room, one or two webcam should be placed outside the projection fields yet in a close proximity. Spectators should be allowed to cross into the projection field. The webcams are aimed to capture changes in light created by the motion of spectator within the projection field. Spectators will be invited to interact with the system through body motion, e.g., waving their arms.

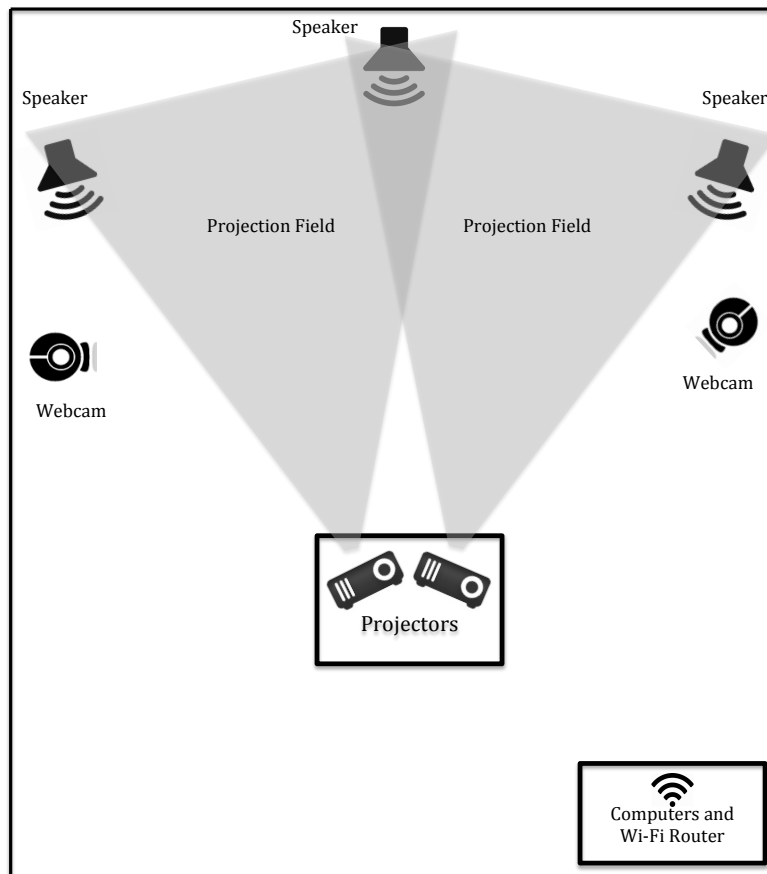


Figure 3. Setup diagram for *Course of Action*. This setup is for a room with three bare walls. Two projectors are used with projection fields offset to the corners of the room.