THE SEQUENCER PARADIGM

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THE interfaces of music sequencing programs are developing their own peculiarities, stimulating artists to give their own interpretations of a well-consolidated paradigm. The recursive flow of the sounds, marked by their elements enclosed in the loops, has been reconfigured with very different parameters and perspectives which have exploited the aesthetical possibilities of their representation. Juxtaposing information and playing it continuously is an inspiring method that stimulates the creation of multiple metaphors and different interfaces that perfectly illustrates the potential of the musical interface, ready to guide the user into the cultural stimulation he wants.

History. The sequencer interface seems very similar to the classic score, but it has a crucial difference: the clear and detailed description of time. It's not yet a matter of decoding clefs and signs. Everything is graphically and intuitively coded, and its interpretation is not yet left to the gesture and the character of the performer. It's a programmed machine calculation and consequent execution. The most closed ancestor to the sequencer concept is probably the piano roll[1], invented in the late 19th century. It was part of self-playing pianos, named as 'player-pianos', and consisted of pianos with a supplemental mechanic that run a song written on a specially cut roll of paper. The sequence of notes was coded in cuts that activated the correspondent keys on the keyboard. So a continuous set of notes with a recognizable paper representation was conceived to play a musical instruments without human help

and with a programmed and unavoidable description of time. We can even find a 'piano roll' option implemented in most of modern software sequencers, like Cubase or Cakewalk, as a simple and effective concept applied to MIDI standard, and nonetheless a tribute to their mechanic grandfather. After the player-piano, a machine with a similar functioning scheme was produced in 1959. It was an experimental device assembled by RCA and presented as 'Music Synthesizer'.[2] It consisted of a huge electronic system that used 'punched paper' as input. Every characteristic of a note was described with a hole in the correspondent column on a prepared roll of paper. There was a special 'typewriter' to punch the holes and a separated 'reader' inside the machine, ready to play the song once it was 'printed'. The linear reading was of the same kind of the piano roll, but it'd be finely programmed by the technician/musician, who took care of correctly describing each note. Then it came the analog sequencer in the sixties, an electronic keyboard with its rows of knobs, describing each tune in their sequence's combination. But this concept led to a different style of sequencer bound to the hardware development and particularly dedicated to live performance and real time manipulation. The next and definitive step took place another decade later. In the late eighties the software production started to increase rapidly, and in this period (1989) the very first version of Cubase came out for the Atati St series,[3] exploiting the new MIDI possibilities with a graphical interface. The techno revolution started a few years earlier has its definitive tool for creating music reflecting the new structure of techno tunes: a continuous flow of rhythm and melody .[4] All the needed sounds would be produced with a single machine or imported/sampled from the outside world.

Abstracting the interface. A couple of years before the first Cubase release, a seminal program stormed the Amiga platform users. It was the Ultimate Soundtracker,[5] a software for sequencing samples in a numerical structure. It was a commercial product, but generated lots of shareware and freeware clones then named

'trackers' from their ancestor. So on one side the tracker phenomenon exploded as 'electronic punk' inside the demo scene, generating a clear style that was followed by hundreds of adopters and even reflected in some electro-pop celebrity group of the time. On the other side the Cubase standard spread among young electronic musicians that started to think in terms of juxtaposing and overlapping sounds. This generation never knew the classical score or purposely refused it as an outdated relic, entranced by the real time feedback and the appealing graphic visualization of the processes in action. The sequencer's semiotic was assumed as the one to learn and its use was an amazing training ground for thousands of people. This lead to commonly consider its interface as a paradigm for electronic music products. In the early nineties a further conceptual development started as original reinterpretations of this semiotic. Artists used to the sequencer's interface and rules created unique versions of the standard. Reducing the sequencer to its essentials was a brilliant example, programmed in shockwave by Suzung Kim, in its 'Grids' series.[6] Using a style reminiscent of John Maeda's playful human-computer interfaces, the grid intended as a temporal net of lines becomes an ideal structure for housing a minimal music sequencer. Another early example was the 'Fruitpencer'[7] programmed by the AntiRom collective, a London crew of designers experimenting with interface conventions. Sounds were represented as fruits, that enlarge when played. One of the Fruitpencer peculiarities is to connect two different senses (taste and hearing), with a single representation. AntiRom developed even an internal version with every member of the collective associated and animated with its credited sound. Synesthesia was another possible issue, and inducing the color/sound association was the aim of 'Hearing Colors',[8] that otherwise proved that these type of sensory connection varies greatly in different cultures. The well known sequencer's interface is no longer universally valid when it is extended to broader cognition categories like colors. But the same interface'd also be seen as a general frame for single

playing sounds. In the most genuine spirit of hacking, Winnoise,[9] for example, is a composition illustrated in real time which masterfully exploits the standard Windows' sounds to compose a pretty decent piece. The piece could be reproduced simply by replicating step by step what is shown in this Flash animation, using multiple copies of a recorder (the SNDREC32 software). Every copy of the recorder can be seen as a single channel, with its own time and modified sound, playing in loop. Nevertheless as a whole they set up a sequencer that plays a stream, resonating with our usual gestures and stimulating pavlovian reactions almost a decade old. A similar structure is build by UK artist Stanza, who in 'Open Source DNA musical generating system,'[10] programmed a matrix of sounds associated with its own DNA (extracted from his blood). The sequence reflects his chromosome X bases, so in some ways it reflects one of the most inner characteristic of his person, using the sequencer structure to represent it with sound loops.

My own sequencer's interface. After being digested, the concept of software sequencing has been translated in a a sort of abstract template, a collection of basic conceptions useful to construct original artifacts. Adapting the form to personal expressions and styles lead to unique interpretations of the sequencer interface and concept, transfiguring the usual design in a different narrative, closest to the artists' own language. 'MaxGumTree,'[11] for example, is composed on an alien language, scrolling slowly as a sort of musical morse code, and an animation of a tree whose fruits are bubblegums. Programmed by the electronic musician Goodiepal and the designer Ulrik Borberg, it translates these interactive animations with the correspondent evolution of its music. The user's intervention is mandatory to keep the sequencer alive, but its own language remains unknown, and the signs are only partially associated with sound. In MaxGumTree the dialogue between the musician and the user take place, abstracting the signs, but with some recognizable basic mechanisms. It's like

playing a game of sound narrative, on the same abstract terrain, with compatible but different languages. Another famous duo, the Köln based Mouse on Mars, were helped to develop 'Actionist Respoke'[12] an interactive sequencer that resembles their own style. Michael Janoschek and Rüdiger Schlömer were the author of this shockwave artifact in the same rough and bizarre sound/visual aesthetic of the duo. There's even a delicate balance hidden: laziness can stop it, but hyperactivity can lead to confusing results. In this case the artists' character is transposed to play with the user, broadening the experience of listening with a recognizable aesthetic. This is more about a higher form of communication that targets the listener, engaging his playing attitude for a specific cultural involvement. On a similar aesthetic side Ralph Ammer's 'Play Parts'[13] is a knowledgeable example of geometrical and dynamic association between shapes and sounds. The arrangement of simple circles or rectangles influences the playing order, or, in a different context, drawing a broken line generates a series of notes, converted in the rectangular shape of samples with an active scan line. Moreover the software takes care of translating the distance of elements into duration of playing, composing a visual feedback for the playful user experience in an ordered structure. A similar use of shape as a distinctive feature could be found in Carla Diana's 'Repercussion'[14] that allows the user to play sequencer-like instruments in the isometric perspective. This kind of representation, widespread in videogames, icons and pixel-intensive graphic design, can be smoothly manipulated. It illustrates the potential of the musical interface, ready to guide the user into the cultural stimulation he wants.

The gesture. The sequencer paradigm's ultimate step out of the computer screen is the material representation of components, and then the gesture of manipulating them. The materialization of abstract software elements is a recognition of the objectivity of this cultural archetype, that seamlessly enters the reality world. James Patten and Ben Recht's 'Audiopad'[15] is one example of physical objects that generate different sound depending on their

position on a tabletop surface. The main idea behind it is to have a tool "where the gestures are more exaggerated then using a mouse". And the the gesture is the key concept, making the process of interactive composing visible to everyone and more clear. It's more "like the kind of interaction you could see with real instruments, than the kind of interaction you have with the word processor".[16] A similar gesture-based work is Block Jam,[17] a Sony prototype made by modular 'instruments' in form of cubes dedicated to compose music. The cubes have an interlocking system and the sequence determinates the sound. Here the symbolic values are joined by a collaborative potential that'd be expressed with more people collaborating on a single track, joining pieces together. These sort of Lego blocks of sound that trigger the gesture materialize the music conception as non-linear composition of sounds and as a dynamic structure that is instantaneously understandable through its tactile feedback. The scan line has returned to be invisible, at the center of our sight, and the sounds have their physical avatars, but the paradigm is conceptually intact. The flow of blocks of sound can be played, stopped and looped. The changes can be done in real time. They reflect our daily rhythm, our demand of 'control' and the contemporary approach to sound.

Bodies' abstraction. All the previous examples belong to the world of music production, but the sequencer has already been implemented as a paradigm as well in the interactive and movie production interface. Form the beginning of Director's Lingo to the latest Flash update, the scan line has become a synonym of the instant present, or what is happening in front of your eyes, and what lies at its left/right are events of the recent past/near future. So different artists has applied the concept of 'playing elements of reality', even outside of the screen, in urban and scientific contexts. Alexander Chen, in 'Sonata for the Unaware',[18] implements this kind of cultural conventions to urban reality in order to play it. People's presence is recorded through fixed camera footage, filmed at various entrances of Philadelphia, and it's interpreted as tunes generating a long score. An invisible scan line is constantly applied to the

images, checking people's movements, so their human bodies are the sounds' activators and their flux is the unconscious structure of a live 'sonata'. The abstraction of bodies in software elements is not a mere conversion of data, but a translation of sense from an incorporeal representation into a physical language. Importing virtual items in the physical reality transforms an interface into a paradigm. The use of bodies is also central in another science experiment, made by the student Levy Lorenzo that expressed the fascination of time in music. His 'Intelligent MIDI Sequencing with Hamster Control,'[19] implements another kind of 'external control'. Six hamsters are locked into six horizontal plastic conduits that resemble the sequencer's 'channels'. Their movements and position is constantly checked by some sensors that convert them in MIDI rhythms and notes. Here we can find some moderate 'generative principles', but the bodies/physical abstraction of elements and their consequent sequencing on a timeline is evidently implemented. Visualization of this process is even more evident in a music clip that undoubtedly incorporates this concept. 'Star Guitar,'[20] directed by Michael Gondry for the famous electronic duo The Chemical Brothers describes a journey as seen from a train window, only the disposition of each passing element in the landscape is positioned exactly in sync with the music. In this way the virtually modified 'real world' is a fictitious mirror of the tune's composition. Moreover the abstraction of buildings in music samples generates a replica of the song's architecture as a fictitious landscape. Furthermore bodies in motion and time-based media are the key components of 'Motion + Melody,'[21] developed by Marc Lin. It's a software-based installation made to consider the body and its movements as a database of sound data, maintaining the scan line as the central element. It's a mirror of self, stretched through time and converted into sound, a distorted visualization of the body interpreted with a different interface. It is inspired by the original Myron Krueger's 'artificial reality' software installations for instinctive audience interaction but it has clearly evolved through the sequencer paradigm.

Conclusions. Analyzing reality as input data with its own software categories is the ultimate evolution of the sequencer. After customizing its interface, artifacts based on its basic structure and the materialization of its elements, the sequencer has become a paradigm for interpreting reality. Its structure is an archetype for organizing flows of homogeneous informations, through a continuous scan. And this paradigm is a result of managing the daily amount of information and, more generally, the contemporary culture in the 21st century

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[1] History of Piano Roll, http://www.pianorolls.com.au/rollhist.htm
[2] Franco Fabbri, Elettronica e Musica, Fabbri Editori, 1984, p. 131
[3] Cubase, http://www.cubase.it/articoli/cj/intervista_steinberg/intervista_steinberg.html
[4] Alessandro Ludovico, Suoni Futuri Digitali, Apogeo, 2000
[5] Tracker, Wikipedia definition, http://en.wikipedia.org/wiki/Tracker
[6] Suzung Kim, Grids, http://www.nabi.or.kr/exhibitions/archive/online/grids/msc.html
[7] Antirom, Fruitpencer, Gas Book vol. 5
[8] Nonsection.org, Hearing Colors, http://www.bpmp.net/cgi-bin/hc_index.html
[9] Winnoise, http://neural.it/nnews/winnoisee.htm
[10] Stanza, Open Source DNA musical generating system, http://www.genomixer.com/opensource/opensourcedna.html
[11] MaxGumTree, http://www.maxgumtree.com/
[12] Actionist Respoke, http://www.stromgasse.de/actionist/actionist.html
[13] Play Parts, http://www.ammerart.de/hp/playparts.html
[14] Carla Diana, Repercussion, http://www.carladiana.com/repercussion/main.html
[15] Audiopad, http://web.media.mit.edu/~jpatten/audiopad/
[16] Audiopad interview, Neural 21, p. 17
[17] Block Jam, http://www.csl.sony.co.jp/IL/projects/blockjam/index.html
[18] Alexander Chen, Sonata for the Unaware, http://www.sonatafortheunaware.com/
[19] Levy Lorenzo, Intelligent MIDI Sequencing with Hamster Control, http://instruct1.cit.cornell.edu//courses/eceprojectsland/STUDENTPROJ/2002to2003/lil2/
[20] Michael Gondry, Star Guitar, http://www.directorfile.com/gondry/ Dxliv.html
[21] Marc Lin, Motion + Melodies, http://www.macaque.net/motionmelody/mm.htm