Open Models

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Umberto Eco wrote, over fifty years ago, in the *Opera aperta (Open Work),* that writing is a field of open meaning. It is dynamic and responsive to reinterpretation, and depends on context and history. It can be said that some forms of writing, for example poetry, are inherently open to reinterpretation by the reader. Or, that any cultural work that stands the test of time, becomes timeless and inscribed in history, is re-read and re-heard by new eyes and new ears.

In music, open fields of meaning may be one way to think about the infinite interpretations that can be made of a single piano sonata. Or it could be a way to understand remix culture, and everything that has followed, including mash ups, and Creative Commons traceable re-use of materials. But these perspectives all pre-suppose that some original work exists, in order to be re-interpreted and re-transmitted. What if the original was not there - what then would the musical Open Work be?

Beyond using Eco's words as a way to understand transmission and re-transmission of ideas, the idea of the Open Work has inspired some artists to rethink structure and authorship. Kazuhiro Jo of the Sinewave Orchestra drew on Eco's ideas, as a way to think about musical works that are by their nature, open. Jo and I used these ideas to extend Roland Barthes's two types of music, *music one plays,* and *music one listens to,* to propose a third kind of music, *Music One Participates In.*

Participation requires people and it requires process. It is in this context, of participatory, procedural, generative media, that chdh have released *egregore - source.* It is a work that is a high example of sound/image. The minimalist pixel-wide lines are not far from Ryoji Ikeda's data work. The flowing lissajous patterns and direct audition recall Robin Fox's laser performances. chdh go beyond pixels and first order sonification to create model-base audiovisuals. Members of the duo have written articles on the subject, including one in the Computer Music Journal where a series of mathematical models are described, using Newtonian physics as ways to simultaneously drive musical and visual structures.

Using an ethos of openness and techniques of physical modelling, chdh have created a work for performance, published release (the object you hold in your hands), user play, and remote network performance. *Egregore* is a form of generative art. Its processes and procedures allow an infinite combination of sound and of image. But it is far from aleatoric. The artists, as authors of the software, as composers of the sound generators, and as painters of the graphical primitives, bring us into their world of flowing topologies, sweeping frequencies, and sudden crackles. The listener becomes operator, having agency over initial conditions, scale, and ultimately the polyphony of this multi-voice instrument. Within this constraint space of human intervention, a virtual physics universe interpolates, makes evident spatio-temporal difference, and creates lifelike traces with its own, internal intent.

By releasing the software and publishing the source code, chdh have made a release of this machine intent, and the composed possibility of human intervention. They are not the only artists to release code. Indeed, this is a movement that was already recognized by the Festival and Prix Ars Electronica in 2003 (CODE: The Language of our Time), and more recently has been appropriated Google in their supposed act of cultural mécénat with their DevArt commission with the Barbican in London. Long before institutional accommodation, net artists such as Jodi, French contemporaries of chdh like Antoine Schmitt, and all Python Poets have used programming languages as their canvas to release, exhibit, perform, and even self-destruct their works.

The release of code, then is a contemporary format. It allows processes and evolutive structures to be published, allowing at once openness and reproducibility. The reproducibility in this case refers not to mass produced replication but is more likened to scientific experimental verification. In this sense, code as art is as much an extension of Benjamin's *Work of Art in the Age of Mechanical Reproduction* as it is about Baudrillard's *Simulations.* According to Benjamin, a reproduced work lacks the authenticity and aura of an original. But what is the original in a software-based process piece? The very lack of an original puts us in the realm of Baudrillard's notion of the *model.* For Baudrillard, first order simulacra require, or respond to and copy or counterfeit an original, while second order simulacra places emphasis on serial and mass reproduction, still recalling an original. It is the model, third order simulacra that, in the absence of an original, becomes the "signifier of reference". In his words, "Finally, it is not serial reproducibility which is fundamental, but the modulation." Modulation - interestingly, a key concept in sound synthesis techniques.

The modularity of *egregore* and its possibilities of cross-modulation of modules do remind us of an analogue modular synthesizer. In this sense, the release, and the code that comprises it, is more an instrument than a "recording." It is an instrument like a musical instrument, in that it begs to be played - by the performer, and by the "listener". It is also an instrument, like a scientific instrument, in its precision and its methods of measuring distance and visualizing movement in the form of deltas (change of position).

As a musical instrument, this "release" is meant to be played. The listener, by opening the programme on the USB stick, initiates the system. From there, the models and algorithms start up and *egregore* comes to life. The listener continues to intervene, nudging parameters, introducing other voices, but the less, the better. As soon as interactivity is offered to the user, there is a tendency to over play, which is not the point here. When chdh themselves perform in concert, their touch is relatively hands off - they are more operators guiding the system than players jamming away.

Finding the right gauge of play on this instrument becomes in itself a questioning of the definition of a musical instrument. The research field concerned with new instrument design and performance is NIME - *New Interfaces for Musical Expression.* In NIME, new musical instruments are made with sensors, with DIY electronics, with mobile technology and GPS signals. In NIME there are audiovisual instruments, and *egregore* is one. There are live coding instruments, and inasmuch as code is the instrument, it is not elaborated on the spot in the case of *egregore.* In this sense, *egregore* is less an improvisation and more a composition.

The release also pushes the boundaries of definition of a musical instrument by being networked. In doing this, chdh bring together two research fields, one of NIME, and the other of Networked Musical Performance. The live "concert" that the duo will perform will not happen in a concert hall or on a stage, it will happen over the Internet. This recalls the videoconferencing concerts I did back in the 1990s with Les Virtualistes, at the Webbar in Paris and at the Sonar Festival '95. It recalls also the Future Sound of London performing from their studio over ISDN. All this has become trivial with the advent of Skype, but the ease of technology does not make the musical task of remote performance any easier. There are European research projects, notably *CoMeDiA,* which push the boundaries of networked music performance. In *egregore,* the artists and audience run the same software, and over the network are transmitted parameter updates which are then rendered locally on each remote listener's instrument.

Rendering is a term more often used in 3D graphics. Here the rendering is at once audio and visual, and is the final output of the instrument in response to a series of processes, whether they be the "listener" playing the instrument locally, the artists remote performing, or the software's own generative and lifelike processes. These processes are not mutually exclusive, but accumulative, creating an interesting level of combination and superposition - of parametric shifts, sound, and vector motion.

The idea of superposition is built into the architecture of the instrument (see system diagram), and in this way, is the final distinction from linear, recorded media. The release, the instrument, is in fact made up of four instruments, or four voices, instead of tracks of a CD. The voices are each an entity worthy of a "piece", but they can be combined and superposed. So the extrusion and sounds of one voice as mapped out through the force fields, topology and tones of another. Hard to describe, better to try out yourself. This frees us from the linear, sequential mode of listening of fixed tracks on a fixed medium, and allows us the parallelisation of experience.

Jacques Attali famously predicted this incipient era in music in 1977 in a classic text hybridising theory, culture, and government policy, *Noise: A Political Economy of Music.* After three phases of *Ritual Sacrifice* (Church music), *Représentation* (scores and stage performance), *Répétition* (recorded media), Attali forecasts a fourth phase called *Composition,* where music becomes process and recovers its ritual magic. chdh, with *egregore,* have composed a nonlinear, participative, networked instrument as a published release. By transmitting their source code, the music is distributed as a Baudrillardian model, ready to be rendered and re-composed by the beholder, finishing an unfinishable process, closing the loop between representation, repetition, composition, and ritual.