

INTERMITTENT

by Claudia Robles and Florian Grond

INTERMITTENT is a generative audio-visual installation consisting of one video projection and a four-channel audio setup with one subwoofer (4.1). Ideally, the speakers are arranged in a quadratic setup depending on the given exhibition space. The video and sound material is looping permanently, and is controlled by a dynamical system in the background.

The behavior of the background dynamics, or logistic map, is one of the simplest dynamical systems to exhibit complex motion: $x[n+1] = a x[n] (1 - x[n])$. The time evolution of this map is controlled by a , the so-called bifurcation parameter. By varying this parameter, it is possible to explore a multiplicity of different motion patterns ranging from simple periodic oscillations to non-periodic behavior, which is also known as deterministic chaos.

For INTERMITTENT, we have selected a phenomenon called intermittency from this rich set of dynamic behaviors. Intermittency is a motion pattern that alternates between ordered periodic oscillations and outbreaks into chaotic movements. To obtain such behavior from the logistical map, the parameter a has to be set to 3.8283, a value that is just at the border between chaos and order. These alternating intervals of periodic and chaotic motions have unpredictable lengths. This is an important feature of deterministic chaos: structures, which are often easily recognizable, also contain an unpredictable element.

Any oscillation from the logistical map, whether periodic or non-periodic, occurs within the range from 0 to 1. These values are mapped onto an interval of frames within a video file. This interval loops slowly through the whole video. Any new value $x[n+1]$ from the logistic function makes the movie jump to a certain position within the interval, from which the movie will continue to play until the next jump. A slight motion blur ensures the visual continuity. In the same way, values from the logistical map are transferred to playback sections from the sound file. The result is a visually and acoustically correlating pattern that maintains its rhythmic characteristics. However, the moving interval slowly and almost unrecognizably changes the displayed content.

The video shows a fire-red stream of melted iron. This stream flows continuously, making bubbles and bursts at irregular times. The audio material is of similar origin and changes between intense bursts and a more even sound. Although the complex behaviour of a stream of melted iron cannot be adequately modelled by the logistical map, the qualitative dynamics of both are to a certain extent comparable. In fact, the puzzling phenomenon of turbulence is most often tackled by means of nonlinear system dynamics.

Neither the video nor the sound materials have narrative structures; the stream seems to flow unchanged forever. Both materials can be reduced to manifestations of their primary natural elements. Fire can be attributed to the hot melted iron, as well as water because of its flow. Earth is represented by the hardened slag, and air, with its volatile character, is also present. In this installation, reduction to material essence meets the concept of mathematical reductionism in the comparison of a logistical map with the fluid dynamics of melted iron.

For a more philosophical perspective on fire and water, the two major natural elements in INTERMITTENT, we refer to Gaston Bachelard. In his book, "La psychanalyse du feu," he writes:

*Le feu suggère le desir de changer, de brusquer le temps,
de porter toute la vie à son terme, à son au-delà. ...,
la destruction est plus qu'un changement, c'est un renouvellement.*

Fire suggests a desire to change, to immediately alter time,
to bring all life to its end, to its place beyond. ...,
The destruction is more than a change, it is a renewal.

To describe the element of water, Bachelard writes the following in "L'eau et les rêves":

*L'eau est la maîtresse du langage fluide, du langage sans heurt,
du langage continu, continué, du langage qui assouplit le rythme,
qui donne une matière uniforme à des rythmes différents.*

Water is the master of a fluid language, a language without friction,
a continuous language, a language that softens rhythm, and that gives
uniform material to different rhythms.

In INTERMITTENT, the juxtaposition of the two elements of fire and water, with their ascribed qualities of continuity and change, is simultaneously present in the video image. Further the dynamical structure also contains these combined notions of steadiness and rupture.

INTERMITTENT seeks to go beyond the classic video loop. Purely periodic loops mostly address the mechanical character of repeated video content. Often, when a periodic structure is discovered, spectators can find some irony, but they are always in danger of being bored by the repetition. However, any generative program that produces erratic motion from pseudo random numbers is prone to arbitrariness, unless both the video and sound contents suggest this kind of "non-repetition." It is generally impossible for the spectator to relate to purely random sequences, since no model for prediction can be built. INTERMITTENT tries to occupy a space between periodic and random construction, by creating a certain familiarity with the processes that are at source of the projection and soundscape. Yet, it continues to surprise the audience with renewed, unpredictable gestures.

Since spectators feel encouraged to discover the hidden algorithmic rule behind the projection, this stream of melted iron does not know any predetermined direction or goal. Instead, this basic natural element appears to be autonomous and active, almost like an animated entity.