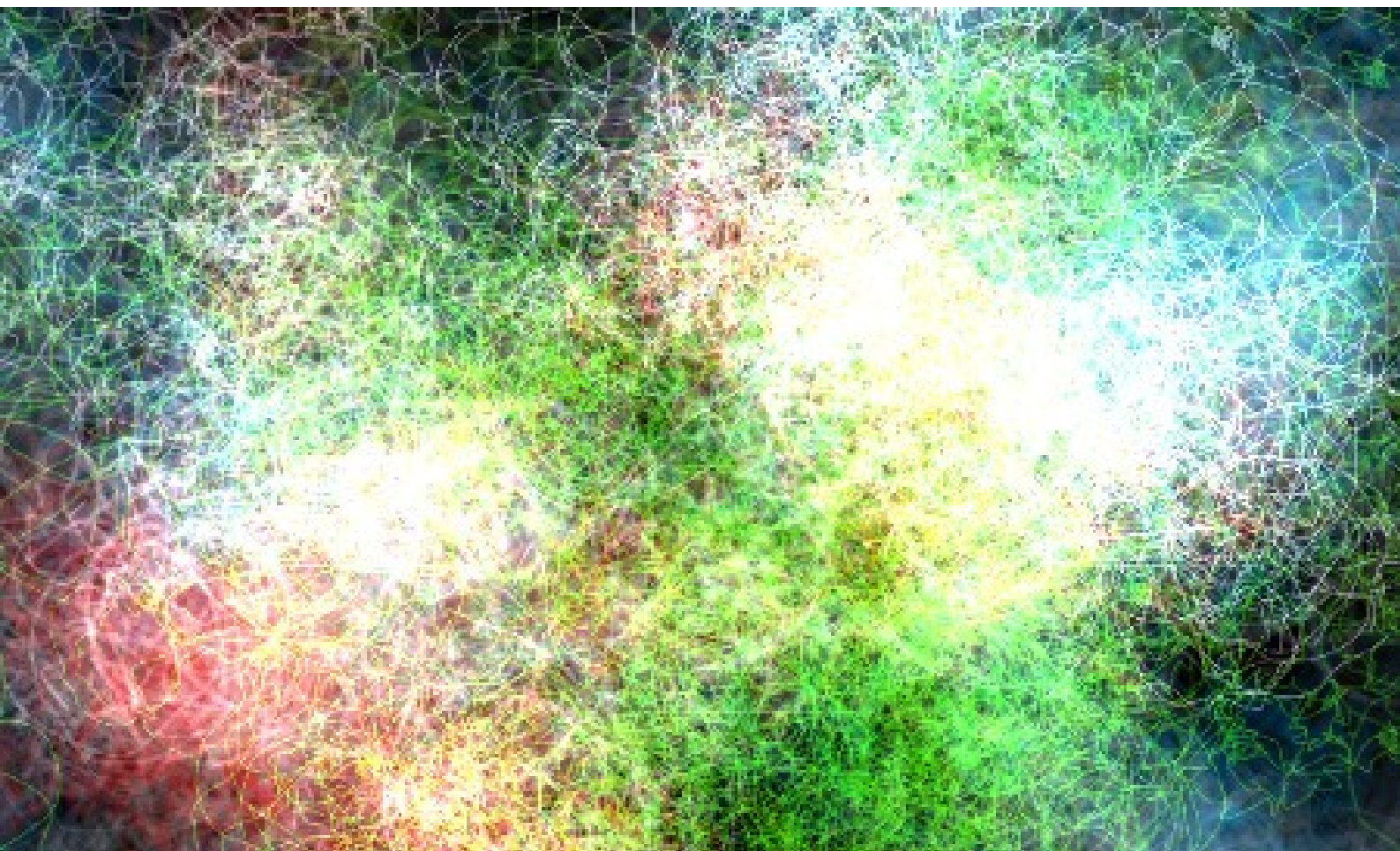


# catodo



## Short Bio



**Catodo** is the stage name of Enrico Zimuel, a computational artist, sound designer and software developer from Turin (Italy). He started to play with algorithmic art at the end of '90s, using 8-bit home computers. He's fascinated by generative art and parametric design, to research unexpected behaviours with computer algorithms.

He exposed artworks in international art exhibitions with artists such as Ryuichi Sakamoto, Carsten Nicolai, Christian Fennesz, Jaromil, Tobias Bernstrup, Giuseppe La Spada, and others.

He co-founded the experimental music group "Gli Elettrodi" in 1998, together with Anodo (a.k.a. Globster). He released music albums with Kutmusic label.

He's a TEDx speaker and international speaker about programming and creative coding. He got a B.Sc. honors degree in Computer Science and Economics and he studied creative programming and computer music at Monash University (Australia) and California Institute of the Arts (USA).

## Exhibitions (extract)

- *Condizione Umana*, [Here 2017](#), La Cavallerizza, Turin (Italy), 2017
- *Noise Curve*, [Virtuality Ladder](#), Studio d'Arte SL, Milan (Italy), 2017
- *Genera*, [Una Diversa Geografia](#), Villa Pravernara, Valenza (Italy), 2016
- *De obsolescentia*, [Sublimis exhibithion](#), La Triennale, Milan (Italy), 2015
- *Reflections*, [Game Happens!](#), Villa Durazzo Bombrini, Genoa (Italy), 2015
- *ASCII Bash Art*, [DoloresArt Laboratory Open Season 2015](#), Palazzo Viti, Volterra (Italy), 2015
- *Big Data & Computational Art*, [DataBeers Torino 2015](#), Officine Corsare, Turin (Italy)
- *Borders*, [New Folder festival 2014](#), Spazio Matta, Pescara (Italy)
- *Defrag (live performance)*, [XVII Generative Art International Conference](#), Cervantes Gallery, P.zza Navona, Rome (Italy), 2014
- *Interattività emozionale con Theremino*, [Internet Of Things conference](#), Turin (Italy), 2014
- *Random cuts (live performance)*, [The Others](#), Turin (Italy), 2014
- *Experiments in code, generative art in Javascript*, [JsDay](#), Verona (Italy), 2014
- *The Bosch's garden*, [Garden of Eden](#), DoloresArt Laboratory, Palazzo Viti, Volterra (Italy), 2014
- *Random cuts (live performance)*, [MutaForma](#), MuMi museum, Francavilla Al Mare (Italy), 2014
- *Perimetri*, [MutaForma](#), MuMi museum, Francavilla Al Mare (Italy), 2014
- *Random cuts (live performance)*, [New Folder](#), Electronic Performance Festival, Pescara (Italy), 2013
- *Random cuts (live performance)*, [Generative Art International Conference](#), La Triennale, Milan (Italy), 2013
- *Creative programming, creating with a computer language*, [TEDx Crocetta](#), Turin (Italy), 2013
- *Programmazione creativa con Processing*, [Digital Festival 2013](#), Turin (Italy)
- *Sul filo della lama, contemporary art exhibition*, [Palazzo dei Vicari](#), Scarperia – Florence (Italy), 2013
- *Introduzione all'arte generativa*, [Accademia Pictor](#), Turin (Italy), 2012
- *LAMPO NET & Contemporary Art Exhibition*, [Aurum](#), Pescara (Italy), 2012

# Artworks

(extract)

## Condizione Umana



**Condizione Umana** is an interactive installation designed with Valentina Peter (a.k.a. *Effemeride*), an Italian artist that works with books and papers. The artwork wants to be a reflection on the human condition (*condizione umana* in Italian). We used an Italian book of 1920 and a pair of windows from a house in Turin from the same era.

We selected 8 pages from the book and extracted 8 sentences that represent a human condition. Each sentence has been converted in speech, using a female and a male voices. Each sound sample has been divided in sub-samples and stored in a Raspberry Pi computer.

Using a custom software, the computer selects a page from the book and reads a random phrase from the collection of samples. The result is an endless dialogue between woman and man. When the computer selects a page it also turns on a LED, located under the page to give a visual feedback to the visitors.

The interaction part is made using a PIR motion sensor that turns on the computer algorithm when a visitor approaches the installation.

A sample sound of the installation is available [here](#).

**Materials:** paper, wood, Raspberry Pi computer, custom software, LED, PIR motion sensor, sound speakers.



# Noise Curve



**Noise Curve** is a sound (and visual) installation that searches for hidden information in almost silent sound samples. The audio samples come from field recording in uninhabited places.

Using a custom software, the sound samples are analyzed with a Fast Fourier Transform (FFT) algorithm, that produces the frequency domain of the signal. These frequencies are used to plot a curve on the screen that leaves an indelible mark over time. This curve is used to represent the sound in a single two-dimensional image.

*Noise curves are a common way to measure and specify background noise in unoccupied buildings and spaces. Their purpose is to produce a single value representation of a complete sound spectrum.*

A video extract of the installation is available [here](#).

**Materials:** mini projector LCD, Raspberry Pi, custom software, headphones, sample sounds, Kodak Carousel S-AV 2010.

# De obsolescentia



**De obsolescentia** is an interactive installation, designed together with [Giuseppe La Spada](#), and presented at [La Triennale](#) of Milan (Italy) during the [Sublimis](#) art exhibition from 19th to 28th October 2015.

*We live in times that impose a rapid decline of the image, information, and emotion. This self-imposed or auto-produced noise overshadows everything that is not close to us; the decomposition process starts simultaneously to fruition.*

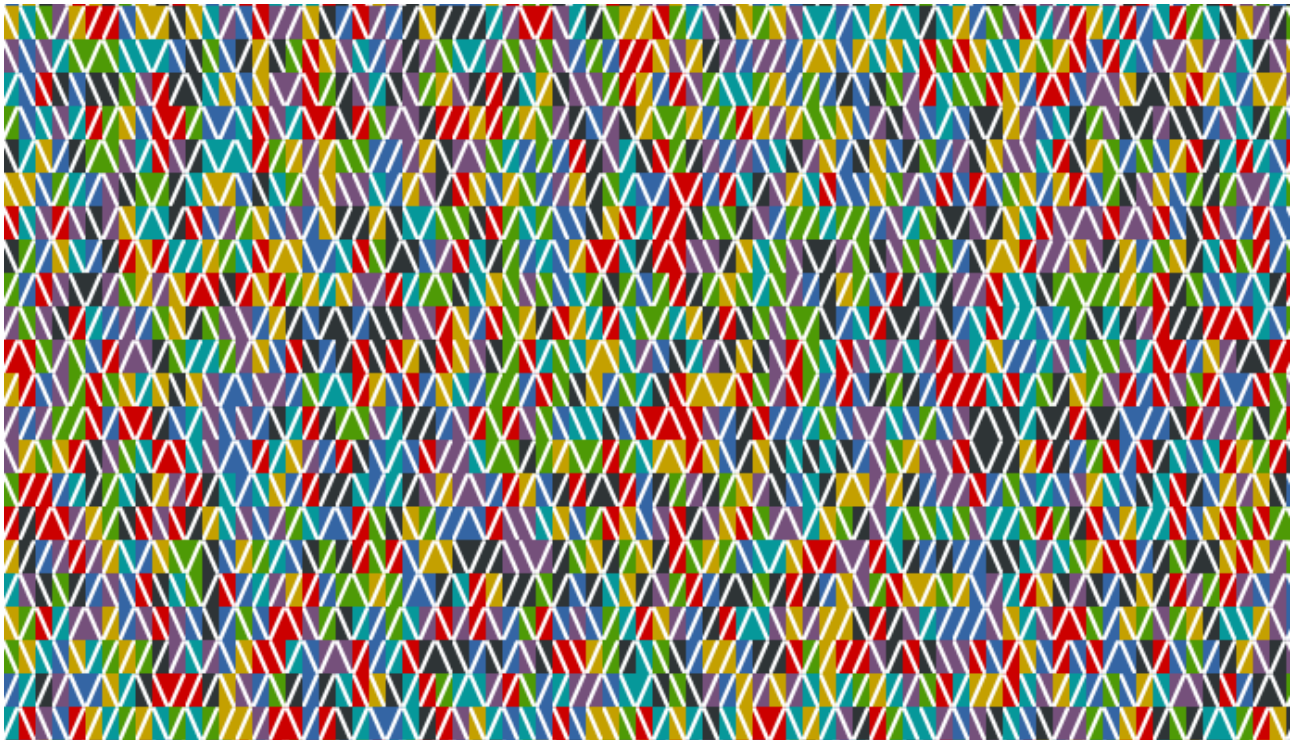
The visitor is invited to alter the photos of [Giuseppe La Spada](#) using the hands, positioned on the [Leap Motion](#) device. A virtual rubbing that plays with passing time, interpreted as dislocation of the pixels.

I provided also a *net.art* version of the installation available here: [catodo.net/deobsolescentia](http://catodo.net/deobsolescentia)

**Materials:** monitor Full HD 46", computer, Leap Motion, custom software, stereo headphones



# ASCII Bash Art



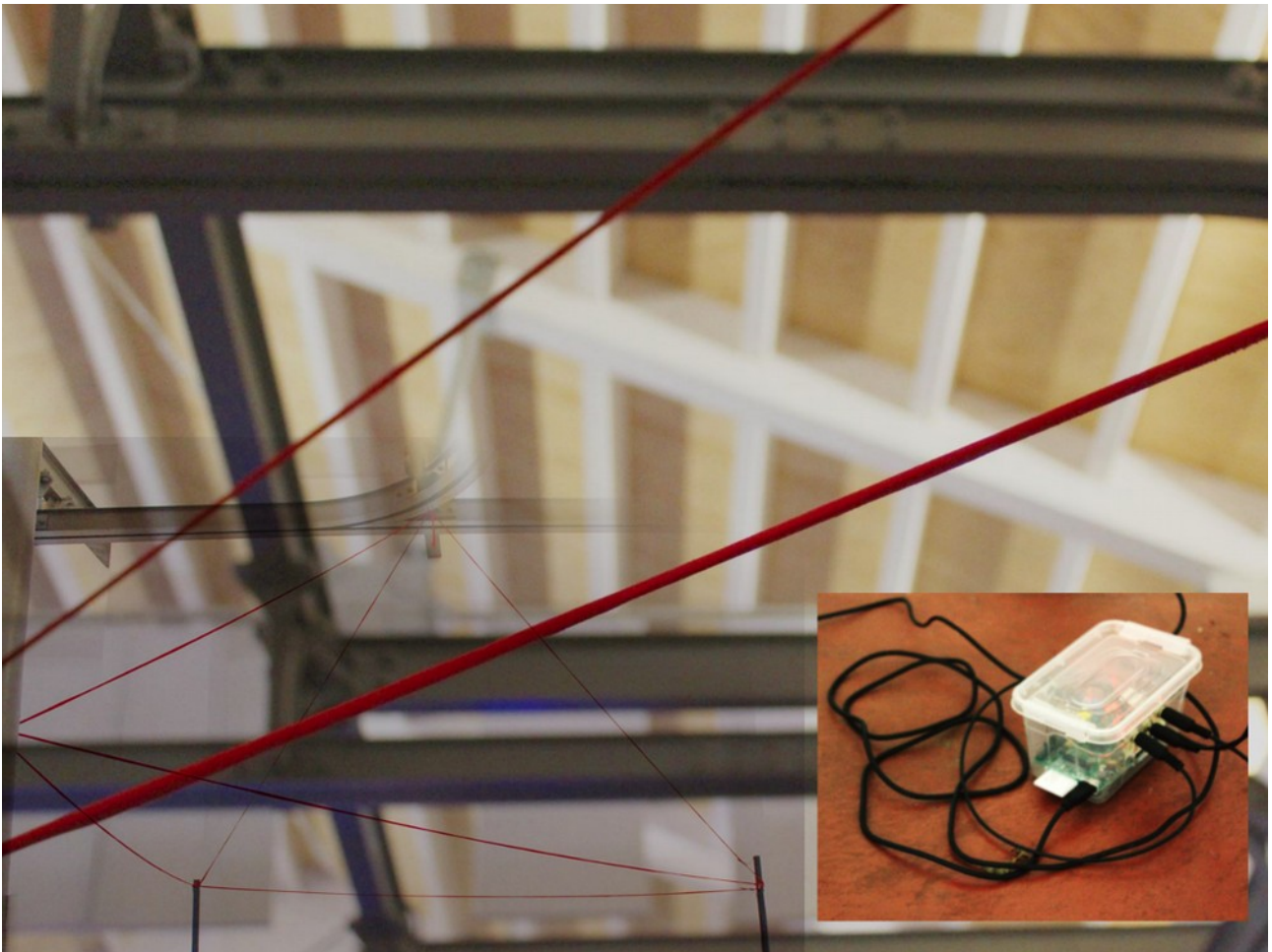
**ASCII Bash Art** is a collection of micro-programs of one line of code, written in [Bash](#), the shell language of UNIX-like computer operating systems. This project is part of a research activity of the artist started in 1996 to design micro codes capable to produce interesting behaviour in the field of visual art, conceptual art, and sound art. The choice of use Bash as language to produce these experiments is driven by a specific need to research art in computer aspects that are very far from the concept of art itself. The Bash language has been invented by Brian J. Fox in 1989, to use a computer providing specific instructions, without the usage of a graphic interface. The artwork produced using this computer language are based on ASCII characters, printed using infinite loops.

**This is an example of micro program that** produces an infinite random maze, based on the idea of [10 PRINT](#) project (image reported above):

```
for((;;x=RANDOM%2+2571)){ printf "\e[1;${(RANDOM%7+40)}m\U$x";}
```

**Materials:** digital prints 32x32 cm, custom softwares in Bash

# Geometrie assolute per ordinare le tempeste

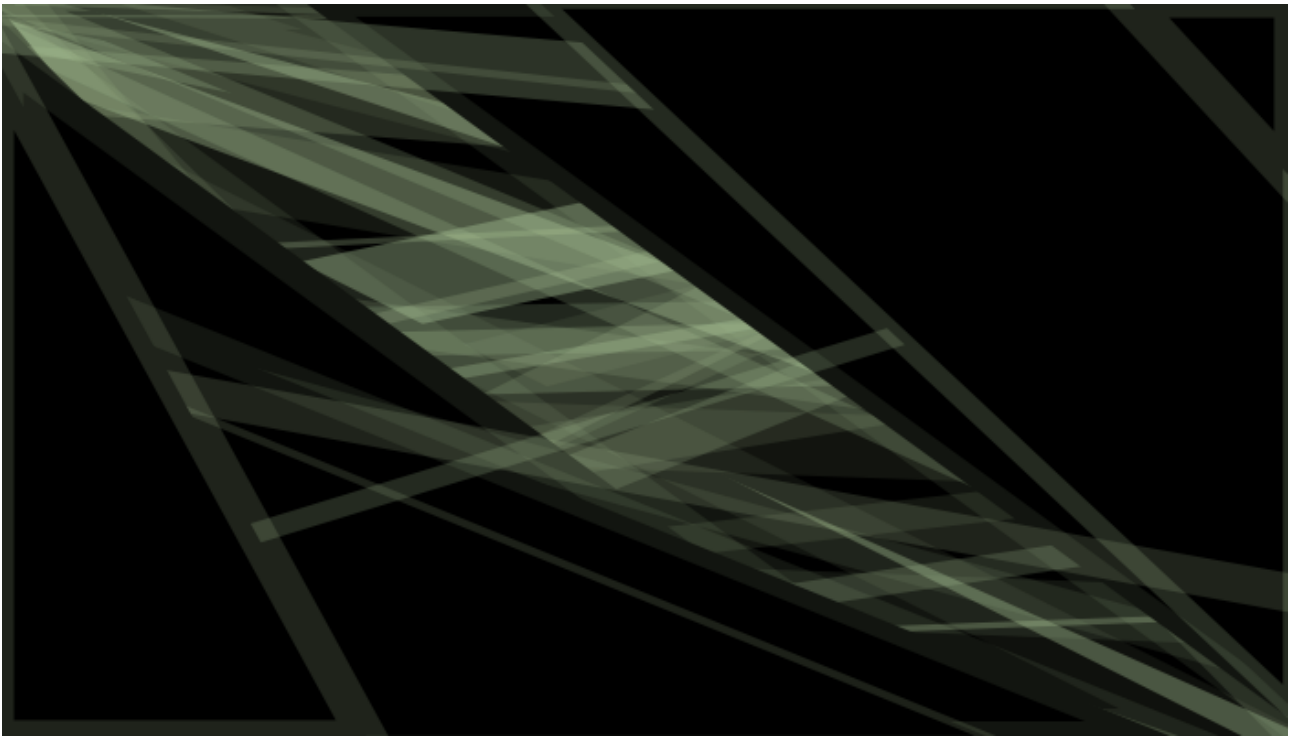


Interactive installation of fiber art, based on the artwork “geometrie assolute per ordinare le tempeste”, of Massimo Desiato (aka **teschiourbano**). This is an ongoing project that collects some of the techniques developed by working on research and the interaction between different materials. The geometric structures are in connection with each other and with a solid base, create a network in an attempt to dominate the passions which inevitably transform those simple ties in a real symbiosis. The result is a collection that try to imitate the complexity of human relationships.

We created a geometric structure using ribbons of red cotton and we applied vibration sensors on it. If a visitor touch one of these ribbons, the vibration sensor activates a random audio sample. The audio samples have been recorded by a script read by the actresses *Valentina Papagna*, *Laura Forlani* and *Lara Romano*. We have divided the samples on three different sections of the script and applied on different ribbons. The result is a generative novel that follows a specific context but in a random way.

**Materials:** ribbons, Raspberry Pi, vibration sensors, custom software in Python.

# Borders



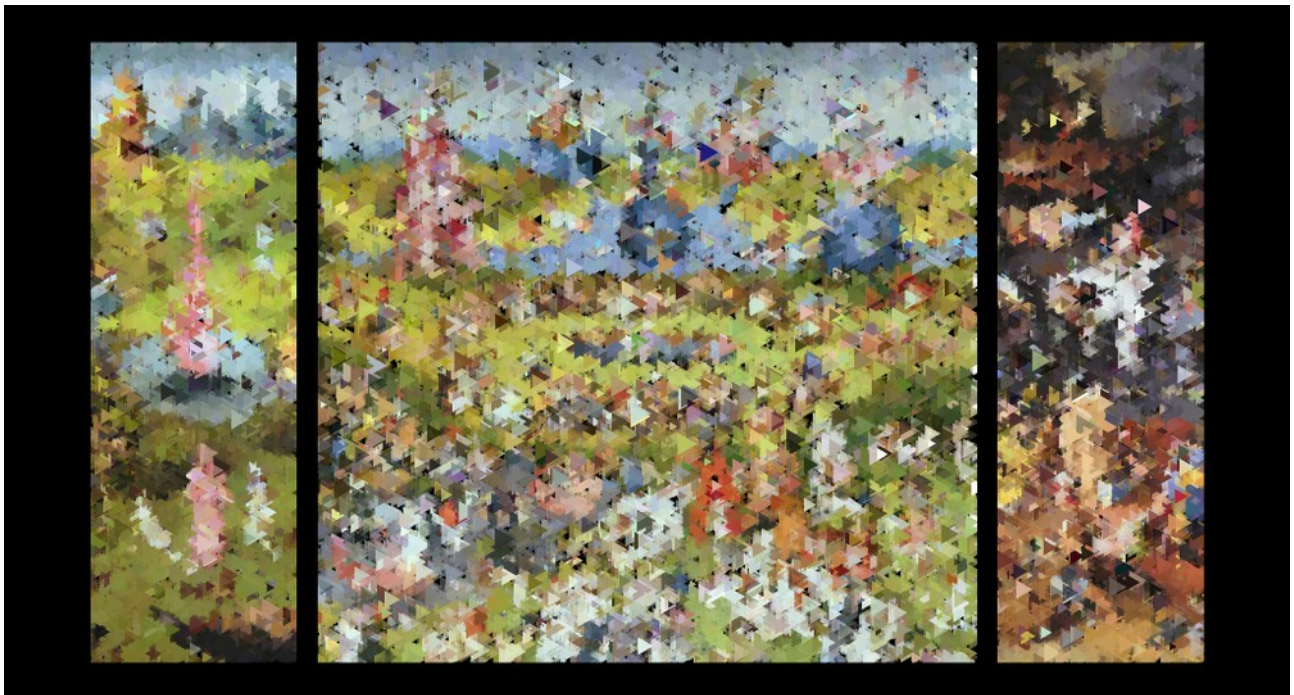
**Borders** is a computational artwork based on my previous project [Random Cuts](#). The idea is to create “digital sculptures”, using a simple generative algorithm that draws lines and triangles with different colors and alpha values. Playing with the idea of borders, the “digital sculpture” is constructed step by step, using lines as constructive parts and triangles as cuts, to remove parts. This project investigates also the idea of simplicity of an algorithm compared with the meaning of expressivity and aesthetics in the visual art.

At the page <http://www.catodo.net/borders/> is possible to see the algorithm in action (written using p5.js Javascript library).

**Materials:** Full HD projector, Raspberry Pi, custom software in Python



# The Bosch's Garden



**The Bosch's Garden** is a generative artwork realized with a custom software that pick random colors from the "The Garden of Earthly Delights" of Hieronymus Bosch and draw triangles with a random size (pointillism effect). I used the triangle as basic shape for the artwork due to its esoteric symbol. That because, the artwork of Bosch is full of symbolic figures and I paid homage to the original idea of the artwork, in a generative way. The source code of the algorithm used to generate this artwork is reported [here](#).

In this video <https://vimeo.com/90464720> you can see the algorithm in action.

**Materials:** digital print, 130x70cm, custom software

# Perimetri



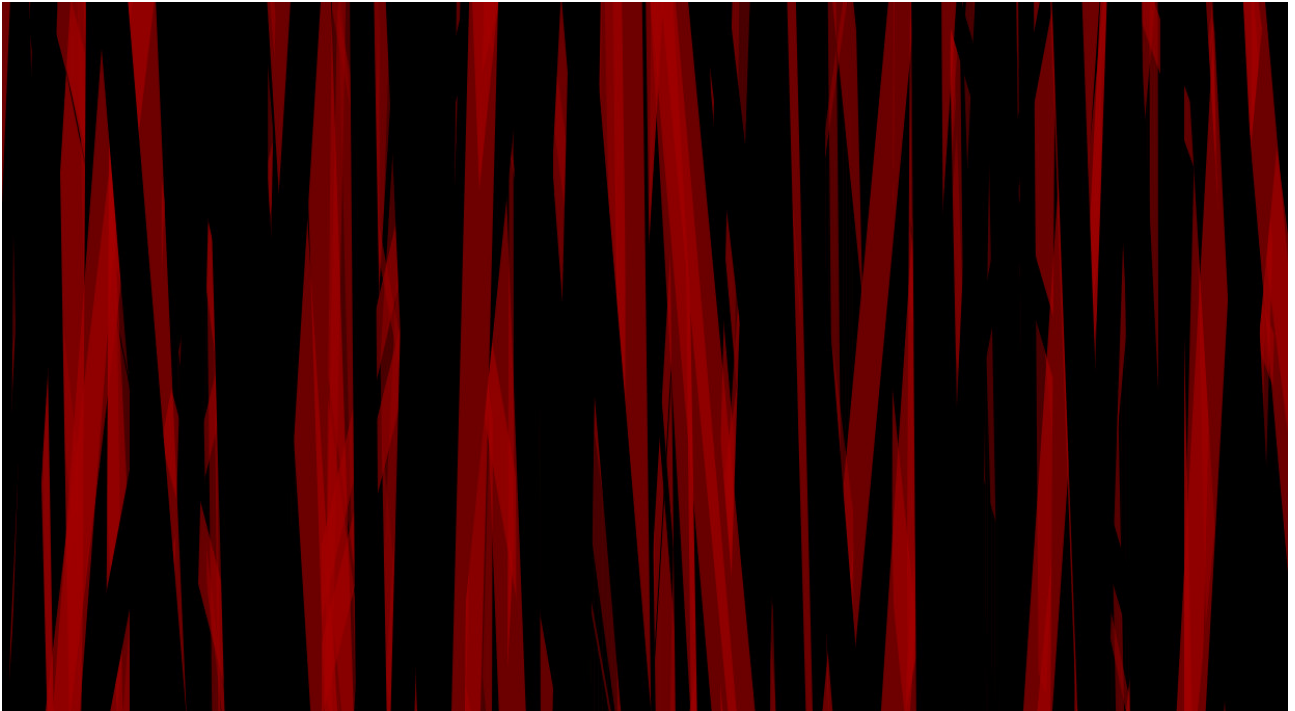
**Perimetri** is a video mapping installation presented at MutaForma 2014, the Abruzzo Art Biennial, at the MuMi museum of Francavilla Al Mare (Italy). The Perimetri project has been realized together with [Lorenzo Kamerlengo](#). The project is based on the paper "The Picture Frame: An Aesthetic Study" of [Georg Simmel](#) and it uses some pictures taken from the artworks of [Francesco Paolo Michetti](#) (1851-1929), the artist to whom is dedicated the MuMi museum.

We developed a generative software that produces random cuts of some famous Michetti's pictures and project it on parallelepipeds in a space, using a self-made video mapping software running on a Raspberry Pi. We used two projectors to map the solids in all the sides, in order to create an immersive environment where visitors can pass in. The source code of the project, including the video mapping, has been released as open source [here](#).

**Materials:** wood structures with different dimension, 2 Full HD projectors, 2 Raspberry Pi, custom software



## Random cuts (installation)



**Random cuts** is a generative artwork installation that generates random cuts on a screen in an infinite loop. The installation experiments with simple lines that simulate a cut on the screen. The software uses two different cuts, constructive and destructive. For the constructive cut the color used is red and for the destructive the black color. The cuts are applied in sequence, in horizontal format (cut #1), vertical format (cut #2) and both (cut #3).

The complete source code of the project with a [controlP5](#) interface is available [here](#)

Here is reported a video extract of the art exhibition: <https://vimeo.com/61521947>

**Materials:** Projector Full HD, Raspberry Pi/laptop, custom software

## Random cuts (performance)

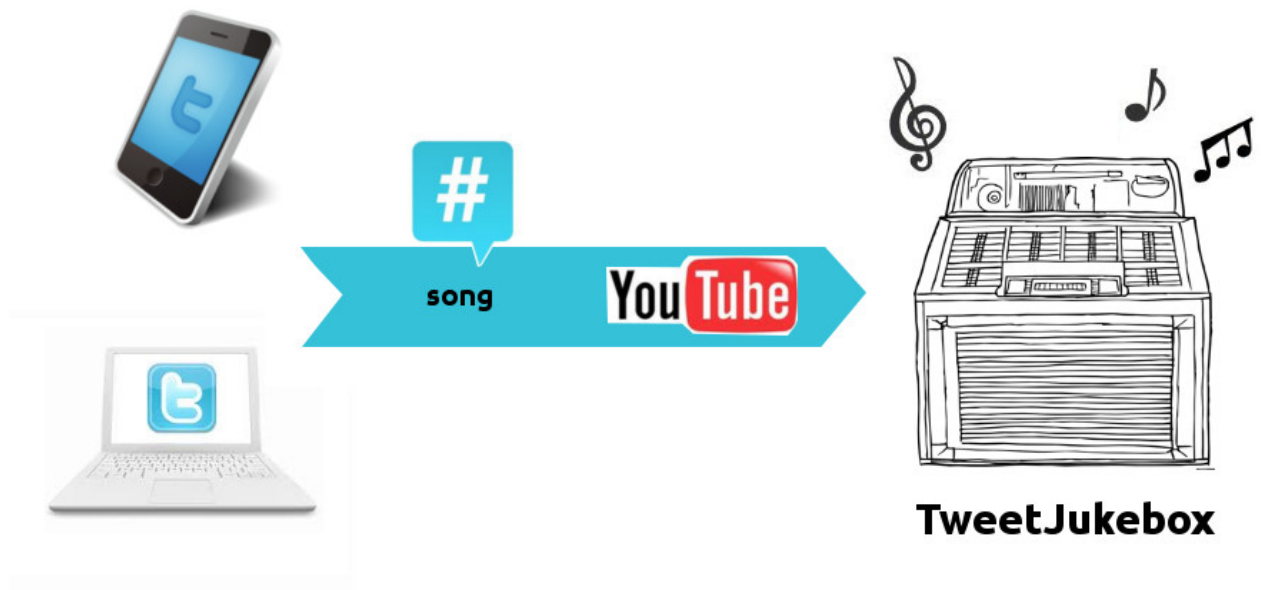


**Random cuts** is a live performance of generative art. The artwork is inspired to the act of cutting, as constructive or destructive fact. The artist implemented a generative software (using Processing) that try to generates a “structure” cutting the randomness, using video and audio signals. The result is a strong impact performance, from a visual and audio point of view. The software is managed in real time by a [Leap Motion](#) interface using an external signal processor unit to modulate the sound waves. From white noise signals to complex additive synth sounds and from blank video to complex structures of lines, the performance lives in a borderline state, between order and chaos. The duration of the performance is about 20 minutes. This work is licensed under a Creative Commons Attribution 4.0 International License. The source code of the software is available [here](#).

Here is reported an extrac of a recent performance: <https://vimeo.com/111568562>

**Project details:** Projector Full HD, Leap Motion, laptop, custom software, stereo speakers

# TweetJukeBox



TweetJukeBox is a jukebox piloted using Twitter. A traditional jukebox is a device of public installation that plays music in after the introduction of a coin and the selection of a song. In the TweetJukebox you don't have to insert a coin to listen the music, you need only to send a message (a tweet) with the name of song, using a special hashtag (#): **#lampojukebox**.

The song is searched in the database of Youtube and played from the jukebox. Everyone can choose the song sending a tweet but only the people near the jukebox will listen the song. That means the choose of the song is delocalized, in the cyberspace, instead the listen is located near the juxebox, in the real life. Moreover, considering the dimension of the Youtube's database, the TweetJukebox become a "*celestial jukebox*", a jukebox that can play basically all the songs available on Internet.

TweetJukeBox is an *open source* software that can be installed in a GNU/Linux machine.

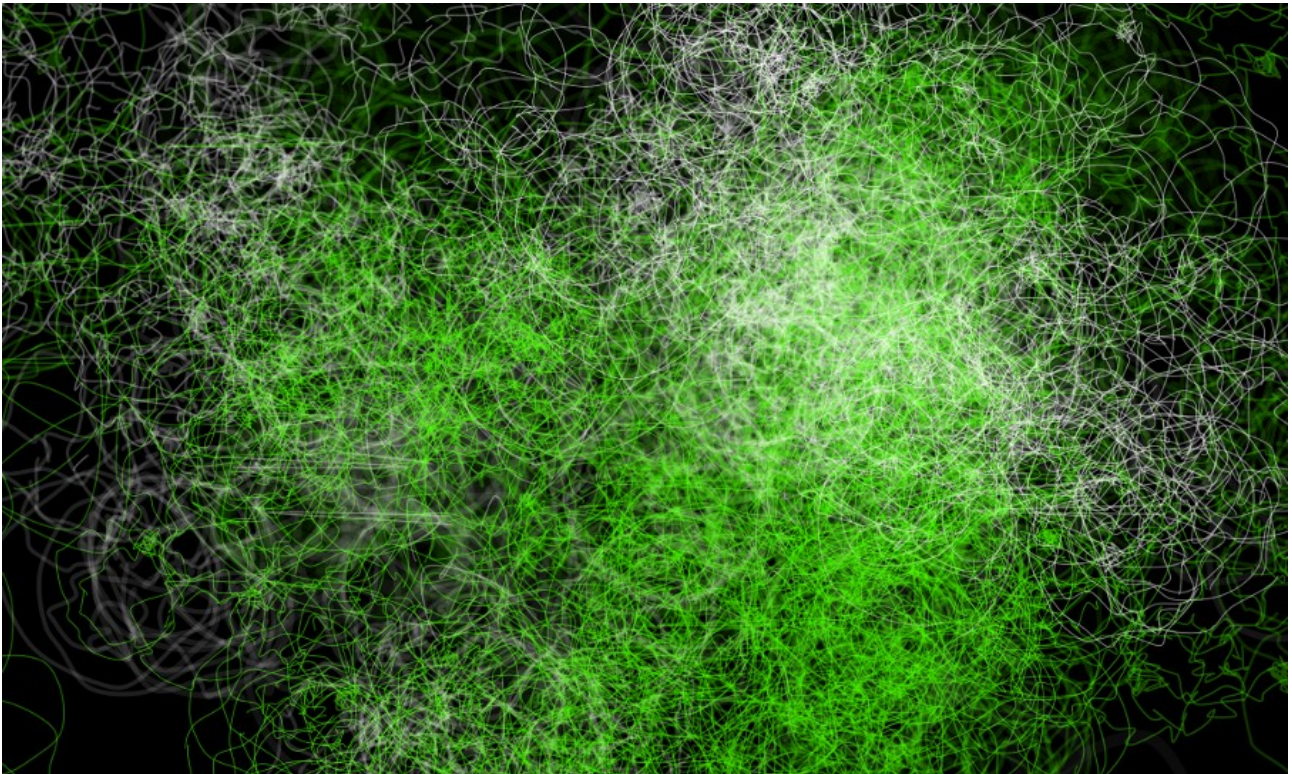
[Here](#) you can find the source code of the project.



**Materials:** Raspberry PI, custom software, stereo speakers. Aluminum structures of rectangular shape with velcro installed in the perimeter. Dimension: 98,5x98,5x35 cm.



# Iterations



**Iterations** is a generative artwork based on the architecture of the Aurum building in Pescara (Italy), the structure that accommodated the LAMPO exhibition on new frontiers of digital art. The architecture of Aurum in Pescara has almost a circular shape that reminds the structure of an amphitheater.

Inspired by this shape, I built a computer algorithm that:

1. generates a variable number of points on a circle;
2. moves these points by a random value along the x and y axes;
3. joins these points using a spline based on the algorithm of Catmull-Rom.

The result of this algorithm has been used as a pattern for the generation of the images. I used a random approach in the choice of the position, of the dimension of the radius, of the size of the lines, and for the value of the alpha color that has determined the opacity of the images. The management of the opacity has created an interesting effect of blurring that has produced a visual result similar to a complex system. I experimented with three different predominant colors (green, red, and blue) and with a neutral color, white, generating three images in high resolution (100x70 cm) that represent the interconnection of two complex networks.

[Here](#) you can find the source code of the project.

**Materials:** 3 digital prints 100x70 cm, custom software