

Press book



Exhibition

auto-mathic

29.06– 02.09.2018

Arts Santa Mònica

Level 2



INDEX

1. FILE OF THE EXHIBITION	3
2. THE PROJECTS.....	5
3. ACTIVITIES RELATED TO THE EXHIBITION.....	13
4. CREDITS	15

1. FILE OF THE EXHITION

auto-mathic

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Level 2



An exhibition that addresses the limits and potentials of generative drawing, emerging from data through mathematical and mechanical operations; raising questions on automation, reproducibility, and the role of the arbitrary or accidents as sources of creative experimentation.

In a time where society and culture are undergoing radical shifts, and due to the inevitable advancement of technology and its forceful intrusion within our lives, this research uses drawing, a creative practice known to all as a tool to explore and understand questions that can be intimidating to some, and exciting to others:

What is the status of our relationship to technology today, and how can it enrich our practices, beyond optimization and efficiency? In a process involving both humans and machines, what are the limits of their respective roles?

The research project *Machinic Protocols* leaves aside the 'hand of the artist'. The final form results from imposed conditions rather than preconceived ideas. It is based on the principle of not designing the final form of a product, but enunciating the instructions that govern its production. Even though the term *machinic* may evoke a mechanical act, it mainly refers to an attitude: that of relying on automatized processes to perform a task. Once the process has begun, it runs on its own and the 'author' becomes a spectator. The *protocol* is the recipe, a set of instructions that dictate actions to be executed.

Such a process requires trust from the writer of the protocol towards the producer of the outcome, as the final result depends on its execution. Therefore, it can incorporate deviations from our original expectations. We can read these deviations (Edgar Morin) as imprecisions, arbitrariness or even accidents but, on the other hand, they may allow new outcomes to emerge. In the words of Michel Gondry, mistakes are part of the game. Imperfection is our best ally.

auto-mathic displays over **120 drawings** that have been developed over the past three years by more than **80 contributors** ranging from the fields of **computation**,

to **arts** and **design**. They have been **produced by different means** including **people, robots, computers**, and even by **forces of nature**. Not only the ones who define the conditions, but any of us could discern the results from our own obsessions: they can be read as cartographies, sheet music, traces of mechanical movements, graphic displays of numerical data.... Despite the differences of how they are made and can be read, they all share a set of common characteristics: they are always unique and their final form can't be anticipated; they are not created by a single author, but rather by a system composed of plural actors.

However, in their finality, all the drawings are no more than the traces of an automated process. The real intention of this work surpasses the act of drawing; it is about developing an attitude towards creation where one designs and relies on a process rather than envisaging an outcome.

Edouard Cabay, curator

2. THE PROJECTS

Traces – Drawings of energy

"A wave rolls on the surface of the sea, affecting the equilibrium of a floating pendulum causing it to swing. With a pen at its extremity, the pendulum leaves traces of ink on the page below, expressing the rhythm and course of the waves: a translation of the sea."

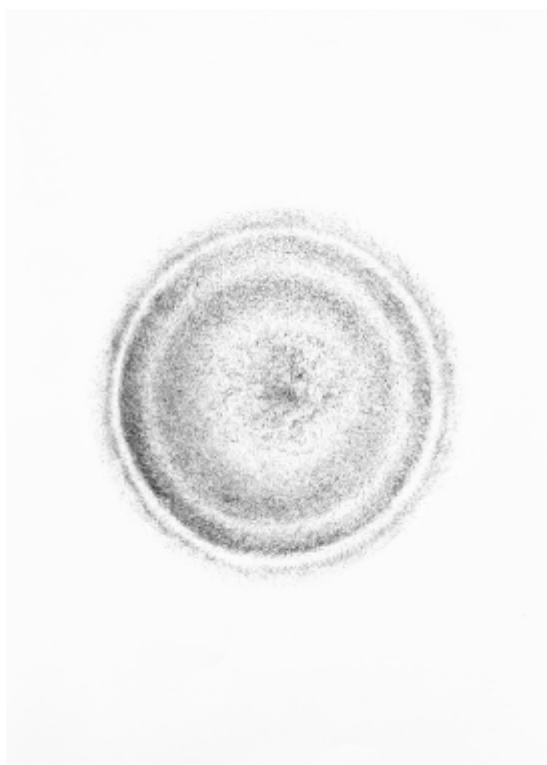
Traces proposes an analogue physical device holding **a pen that will transcribe physical forces such as waves or wind, translating them into drawings**. Each drawing is made over a period of two hours enabling the emergence of graphical patterns that provide a two-dimensional representation of the physical phenomenon. The experiment essentially gives rise to consistent maps of movements or time lapses in nature. Every iteration of the experiment produces a new drawing: their series might share graphic characteristics or patterns as well as calligraphic qualities, but **every page is a unique outcome**, acknowledging the singularity of every moment in nature.



Trace - 02 © Machinic Protocols - IAAC



Trace - 03 © Machinic Protocols - IAAC

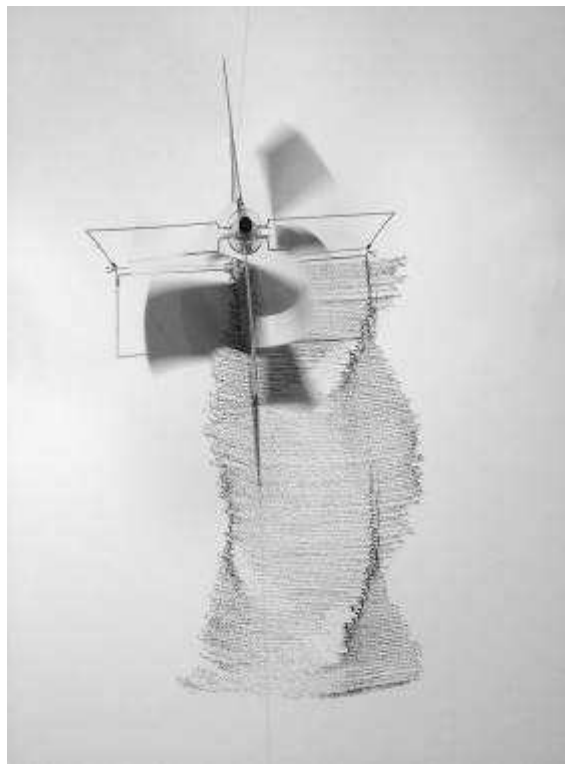


Trace - 04 © Machinic Protocols - IAAC

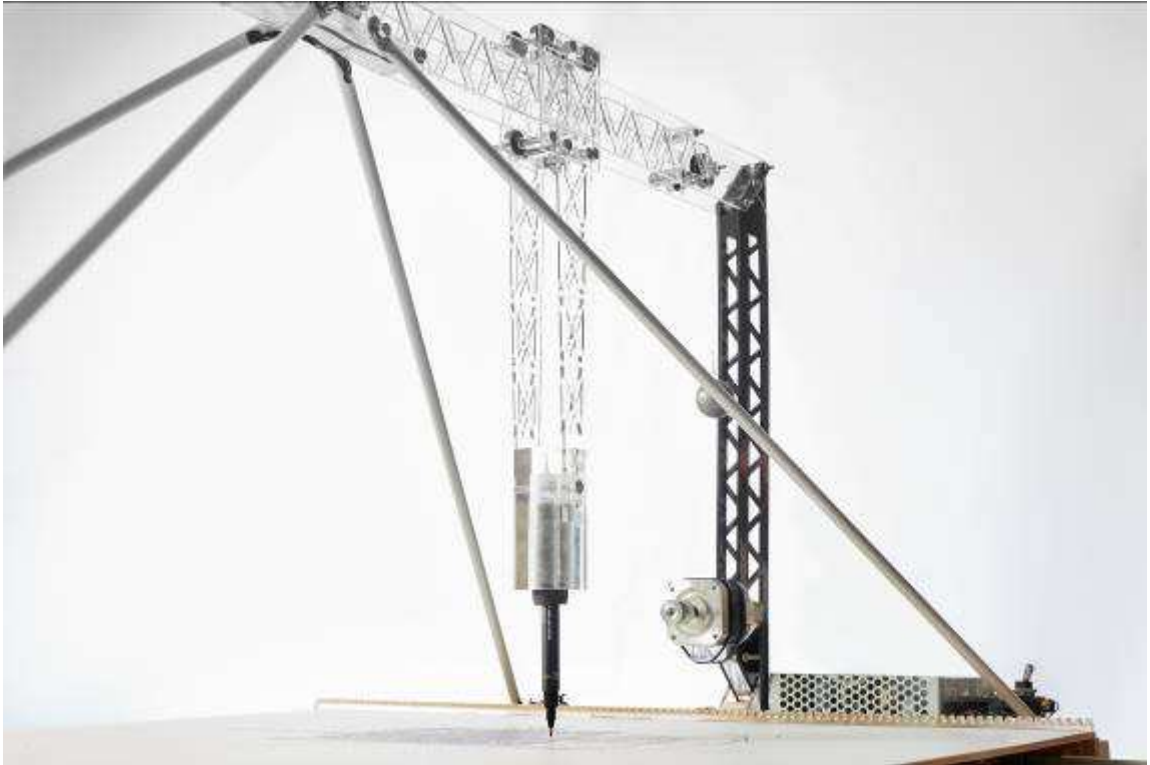
Scripts – anatomy of a drawing Machine

A rotating arm in the middle of a white page holds a pen on an expandable rod, whose rotatory movement is provoked by an electronic board that controls both the speed of revolution and the distance between the pen and the centre of the device. The pen's circular trajectory creates thin lines of ink as a deformed circle; over time, as many circles overlap, varying densities of ink appear on the page, showing the possible paths that the anatomy of the machine permits.

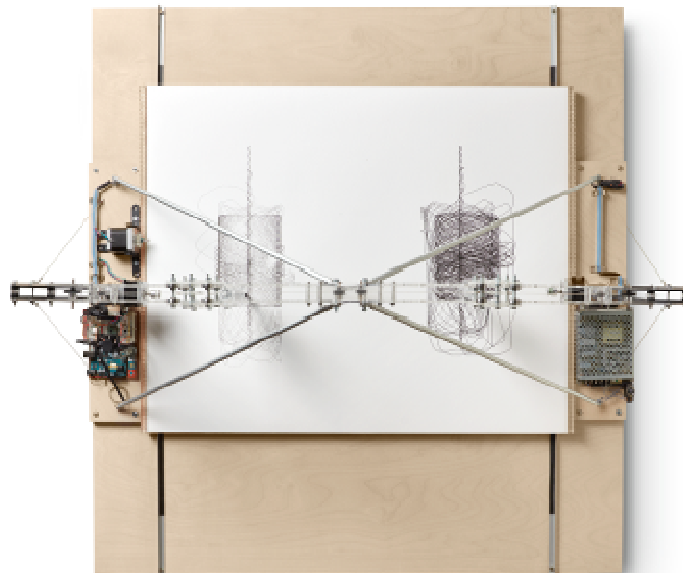
Scripts is an experiment in which physical parts compose mechanisms that compels a movement of a pen on a paper canvas. The drawing machines are fuelled by low voltage electricity, and their movements are controlled by electronically induced impulses. This enables them to potentially connect to the outside world, able to receive information numerically, sensed from the city, to convert data into drawings.



Scripts - 01 © Machinic Protocols - IAAC



Scripts - 02 © Machinic Protocols - IAAC



Scripts - 03 © Machinic Protocols - IAAC

Plots – drawing triptychs

Today, with the emergence of new technologies related to the information age, the means to draw have diversified themselves to an incredible variety of possibilities. Engraving is still used to transfer ink to paper, and simultaneously we are capable of generating live data visualization, converting real-time data into dynamic maps of our environments.

Will the advancement of these new techniques threaten to replace older ones?

Architectural drawing, to take an example, has largely been superseded by computer drawing and yet, there are still many architects who create on the drawing board. This choice is not exclusively related to a question of age or capacity, yet it is tempting to oppose the two techniques, suggesting that we use one or the other, or that one might be better than the others. If we look beyond questions of efficiency or standardization, both techniques have their own attributes, and their own effect on the process of creation.

Plots is an experiment which addresses a basic and complex question: how do the particularities of the act of drawing affect the way in which we think and create?

This work proposes triptychs of drawings made with a single intention, but developed through three different means: a computer, a person and a machine. The protocol, or the set of instructions formulated in three languages enables three different drawing processes: an algorithm for the computer, a text for a person to draw, and a numerical code that controls the gestures of a robot.

These drawings may or may not resemble each other, nevertheless the fact that they were made from a common intention invites us to question their status and relationship between each other; whether they are replicas - or copies - of one another or whether their singular characteristics in the calligraphy and form are the direct consequences of the means that have generated them.

In this process, which involves mathematics, human intuition and mechanical artifacts, **who is the real author?** Is it **the person** that draws, converted into an instrument that executes an order? Is it **the computer** that runs a code and generates drawings of an incredible complexity? Is it **the machine** deploying ink on the paper surface? Or is it the author, the person who has written the protocol, who has engineered the process, but not actually drawn a single line?

This research into non-deterministic drawings sees the generation of graphic forms that escape the realm of representation and figuration, to propose another take on drawing: the one of emergence.

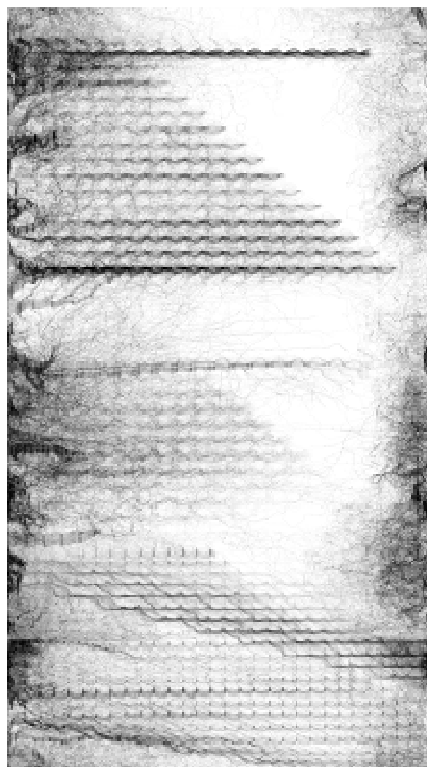
Plots – drawing triptychs

8 fans and a dancing pen

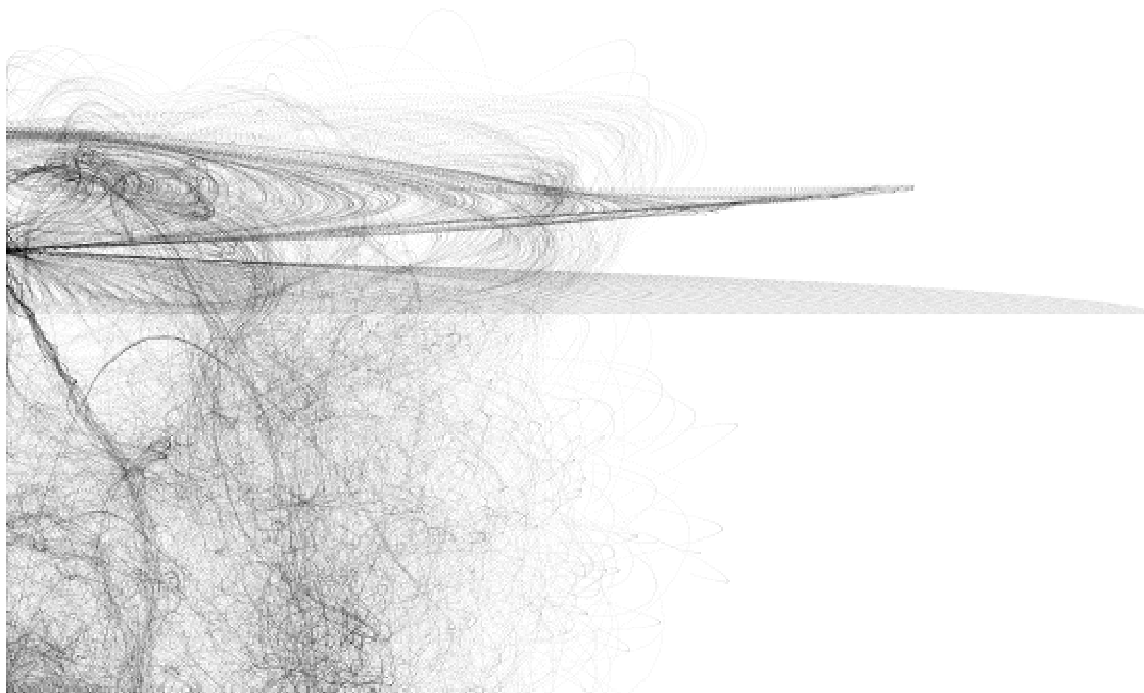
An electronically controlled array of fans blows towards the center of a page where a pen attached to a sail moves to the wind. When the pen gets close to a fan its flow intensifies, pushing it away. In a context of reciprocity, the pen and the fans dialogue to keep the movement perpetual so that the machine never stops drawing.

10.000 ink drops on a dynamic canvas

During the course of the day, **10.000 droplets of ink fall onto a moving canvas from a height of 15 meters.** The canvas is mobile, it moves at the rhythm of the falling drop to receive each one of them in a precise position so as to form an orthogonal grid. This installation is an experiment. Will the drop fall vertically and land in the precise position anticipated by the robot to form the perfect grid, or will the movement of the air affect and other factors deflect it from its trajectory? Only the drawing, which will be made during the exhibition, will provide the answer.



Plots - 01 © Machinic Protocols - IAAC



Plots - 02 © Machinic Protocols - IAAC



Plots - 04 © Machinic Protocols - IAAC

3. ACTIVITIES RELATED TO THE EXHIBITION

Guided tour of the exhibition

By Edouard Cabay
06.07.2018 / 18h
Nivell 2

Lecture

Machinic Protocols
By Edouard Cabay
06.07.2018 / 19h
Lecture room

The work of Machinic Protocols addresses the limits and potentials of generative drawing, emerging from data through mathematical and mechanical operations; raising questions on automation, reproducibility, and the role of the arbitrary or accidents as sources of creative experimentation.

This lecture will be in the framework of IAAC Global Summer School 2018, an intensive two-week course that connects each participant to ongoing research agendas in robotics, physical computing, digital fabrication with the aim to create new applications of technologies in design.

The lecture is part of the 2018 Global Summer School (GSS) programme of the Institute for Advanced Architecture of Catalonia.

Duration: 1 hour approximately.
In English without simultaneous translation.

Conversation

A conversation about the "auto-matic" drawing
With Josep Perelló, physicist and Óscar Guayabero, designer / Moderator:
Olga Subirós, architect
11.07.2018 / 19h
Lecture room

What is our relationship with current technology and how can it enrich our practices, beyond optimization and efficiency? In a process that involves both humans and machines, what are the limits of their respective roles?

The conversation raises questions about automation, reproducibility and the role of everything arbitrary or accidental as a source of creative experimentation.

Guided tour and workshop

Spirograph Bot Machine
12.07.2018 / 17.30-20.15h
Level 2 and Residence Space

Free Activity

Capacity limited to 20 participants

Workshop for youth audiences between the ages 10-15 years

With prior registration: asm@klousner.cat

/ Phone: 935671110

Guided visit to the auto-màtic exhibition and workshop.

In this workshop will be explained and assembled step by step an automated machine to make incredible geometric drawings. We will start by making a manual drawing mechanism: the Spirograph; later we will gradually incorporate electronic components such as motors. In this way we will automate the "bots" until we achieve different types of interaction. Afterwards, each participant will be able to generate as many variations of gears as possible to create the maximum of different figures

Concept and realization FAB LAB Barcelona - Future Learning Unit.

Perfomance and workshop

"Acción Pendular"

By Juan Escudero

18.07.2018 / 18.30-20h

Cloister Max Cahner

Free

Workshop for youth audiences between the ages of 8-16 years and families

Halfway between science and art, physics and painting, the action of drawing geometric compositions on the ground with a pendulum, moved by the force of gravity and inertia, will make you discover how the path traversed by the pendulum is faithfully captured by the painting that comes out. The workshop will be exploring the pendulums, explaining the basic notions of physics of their functioning, as well as putting different possibilities of drawing with materials (sand, salt, paint) into practice and discovering the different effects generated by the tracings of the pendulum.

4. CREDITS

EXHIBITION

auto-mathic is an exhibition developed in the Machinic Protocols research line from the Master in Advanced in Advanced Architecture of the Institute for Advanced Architecture of Catalonia.

Project Director

Edouard Cabay

Project Team

Rodrigo Aguirre, Keesje Avis, Mehmet Berk Bostancı, Kunal Chadha, Peter Geelmuyden Magnus and Lili Tayefi.

Visual identity

Mara Sylvester

Project - Plots 2018

Researchers:

Project 1: Tal Dotan & Martin Garcia-Miro Zaldumbide with Rodrigo Aguirre

Project 2: Aman Jain & Hayder Abdulameer Mohammed Mahdi with Relja Ferusic

Project 3: Gayatri Harikrishana Desai & Ewald Jooste with Roger Paez

Project 4: Bhakti Vinod Loonawat & Matteo Proaño Albuja with Marco Ingrassia

Project 5: Soroush Garivani & Elena Kavtaradze with Isabel Witt

Project 6: Gabrielė Liuda Jurevičiūtė & Deepak Sivadasan with Lluís Viú Rebes

Project 7: Xu Jiang & Takeru Osoegawa with Rebeca Font

Project 8: Arman Najari & Baran Mostafa Tehrani with Crissant Romans

Project 9: Yingxin Du & Ardeshir Talaei with Mademochoritis

Project 10: Marc Bou Assaf & Alberto Emil Holguin Martinez with Ana Isabel Cajiao

Project - Scripts 2017

Machine #1: Valerie Frey

Machine #2: Mehmet Berk Bostancı

Machine #3: Gelder Van Limburg Stirum and Pablo Agustin Vivas

Machine #4: Hsin Li and JengRung Hong, based on original work by Nasser Ghannam, Mohamad Rachid Jalloul, Ceren Yildirim and Guolang Zhang

Machine #5: Cagan Izgi

Machine #6: Athanasios Zervos and Keesje Avis

Machine #7: Kathleen Bainbridge, Irene Ayala Castro, Yasmina Wery and Krati Gorani

Machine #8: Anonymous

Project - Traces 2016

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 Dirk van Wassenauer & Naitik Shah
 Tobias Deeg & Martin Hristov
 Peter Geelmuyden Magnus & Utsav Mathur
 Vishnu Jadia & Khushboo Jain
 Hong Jeng Rung & Ekaterina Simakova
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Special thanks to: Olga Subirós, Vicenç Altaió, Laura Pérez Lupi and Teresa Cheung.

About IAAC

The Institute for Advanced Architecture of Catalonia (IAAC) is a center for research, education, production and outreach, with the mission of envisioning the future habitat of our society and building it in the present.

IAAC follows the digital revolution at all scales (from bits to geography, from micro-controllers to cities, from materials to the territory) to expand the boundaries of architecture and design and meet the challenges faced by humanity. IAAC is an experimental and experiential center where one learns by doing, through a test methodology that promotes real solutions.

About Edouard Cabay

Edouard Cabay has been developing, since 2015, an investigation called Machinic Protocols which uses automated drawing techniques in order to explore notions of indeterminacy and chance in space. The research has been carried mainly in the domain of architectural academia yet strongly engages with other fields such as computational design, digital technologies, drawing as a representative mean, calligraphy and cartography.

He is an architect and professor of architecture. He founded and currently directs Appareil, an experimental architectural office in Barcelona. He teaches, as senior faculty, at the Institute for Advanced Architecture of Catalonia where he also co-directs the Open Thesis Fabrication program. He has taught experimental design studios at the Architectural Association School of Architecture in London, at the Ecole Speciale d'Architecture in Paris and at the Ecole Polytechnique Fédérale de Lausanne.

About Arts Santa Mònica

Arts Santa Mònica is a multi-disciplinary center, with a special focus on the culture around digital media that is produced in Catalonia. The center is a platform for the diffusion of the contemporary creativity of our country, and it presents itself to the public as a space for reflection that encourages discussions and generates ideas about the different concepts that circulate the artistic creation and its relation with the public: creativity, awareness, innovation, knowledge, aesthetics... Furthermore, international artists and creators find the possibility to present their works in the exhibition space.

Organized by: Arts Santa Mònica-Department of Culture

Produced by: IAAC - AAG

Colaborators: SANTLLUC, HP and ABB



ARTS SANTA MÒNICA

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Technical direction: Xavier Roca

Activities

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Management: Cristina Güell
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Communication and Press

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 Tuesday to Saturday 11 h – 21 h. Sunday and holidays 11 h to 17 h. Closed on Monday
