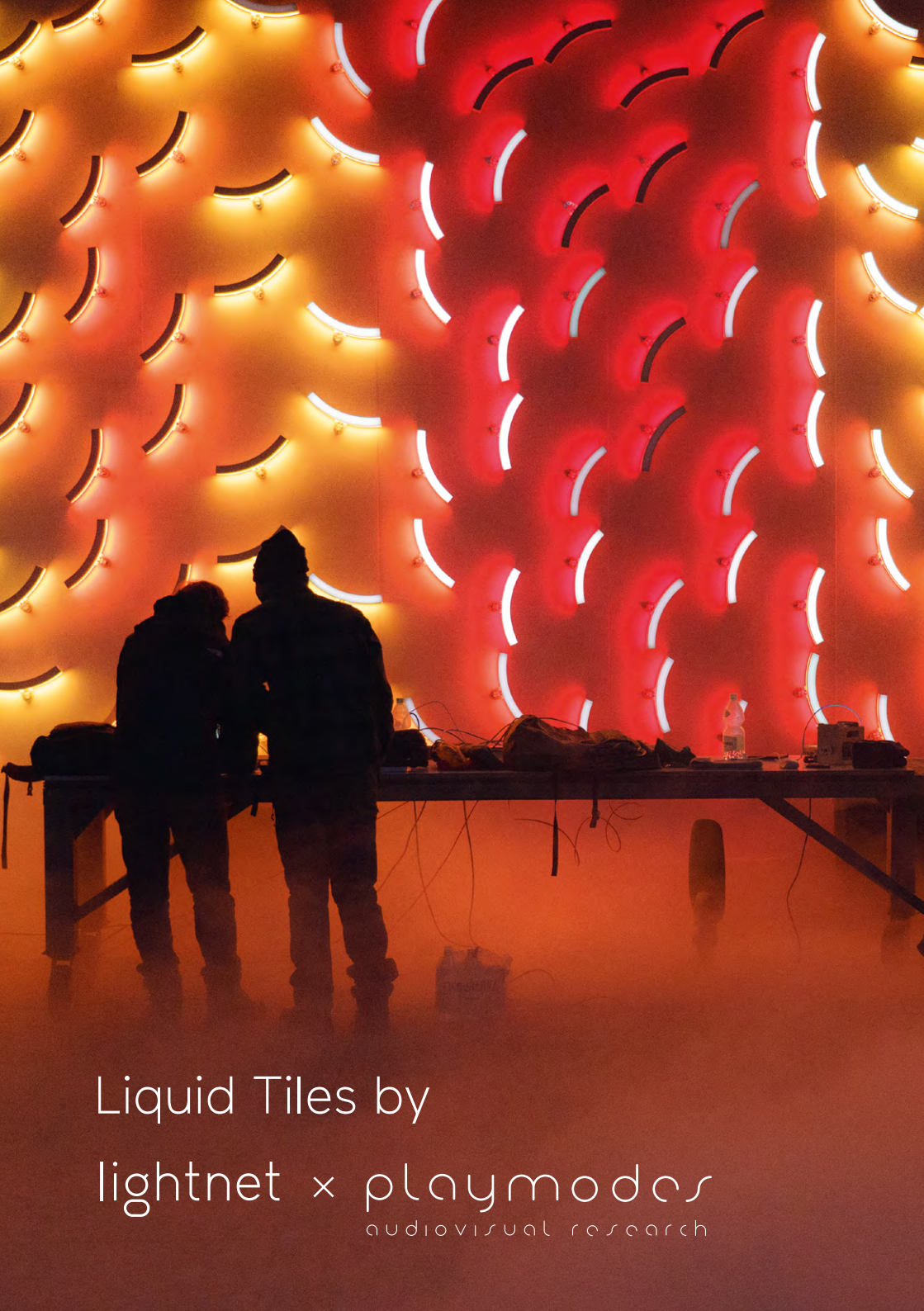


Liquid Tiles by

lightnet × playmodes

audiovisual research

About Playmodes

↑ f.l.t.r. Santi Vilanova, Eloi Maduell

Playmodes is an audiovisual research studio formed by the duo *Eloi Maduell* and *Santi Vilanova*. Working with custom, self-developed technologies, they combine creativity, software and hardware to create immersive installations, projection mapping, architectural lighting, digital scenography, audiovisual instruments and sound design. Their work is defined by innovation, attention to detail and a strong focus on storytelling, resulting in unique experiences that resonate across cultures.

playmodes.com

Liquid Tiles

Liquid Tiles is a kinetic audiovisual canvas conceived as a modular system of 126 computer-controlled rotating light fixtures arranged in a triangular matrix. Each fixture is a curved 60-degree segment which, through its geometric disposition, forms a continuous connective tessellation known as Truchet tiling, named after the 18th-century mathematician Sébastien Truchet. This structure enables local interactions between elements to propagate across the surface, generating larger, evolving visual patterns.

At its core, *Liquid Tiles* explores the emergence of organic behaviors from mechanical and digital systems. Although driven by robotics and custom software, the installation reveals a sense of vitality arising from simple rule-based processes. Generative algorithms define constraints for movement, geometry, colour, and sound, within which the system continuously recomposes itself. The result is a stream of ever-evolving light and sound configurations that behave like a quasi-living organism, blurring distinctions between physical and digital, programmed and organic.

The artwork is the outcome of a close collaboration between *Lightnet,* an architectural lighting manufacturer, and *Playmodes,* a Catalan audiovisual art studio. All firmware, software, and generative systems were developed specifically by the artists for this installation, while the hardware components were researched, engineered, and manufactured in-house by *Lightnet* through a shared design process inspired by the Liquid Line product ensemble. *Liquid Tiles* stands as a living example of how collaboration between industry and the arts can open new perspectives on industrial innovation, contemporary lighting design, and digital art practice.

About Lightnet

↑ Liquid Line A3

Lightnet designs and produces professional architectural lighting to improve people's everyday lives, inspire them and enhance their well-being. Almost 600 employees at seven locations worldwide share a common goal: to inspire our clients. We focus on sustainability and resource conservation, supported by our own LED technology. All our products are manufactured entirely in-house and made to order, precisely tailored to individual requirements and preferences. Our comprehensive in-house production depth enables us to manufacture nearly all components for our luminaires – from raw circuit boards and optical elements to surface finishing and final assembly.

As a manufacturer of sustainable architectural lighting, ‚Made by Lightnet' is our promise, which we put into practice every day at our European production sites. With our sales organisations and international partnerships, we are present across the globe and supply our innovative, customised architectural lighting solutions to more than 60 countries. Numerous projects with renowned architects and lighting designers are a testament to our expertise in light.

lightnet.de

Liquid Tiles – six algorithmic narratives of light, colour, movement and sound

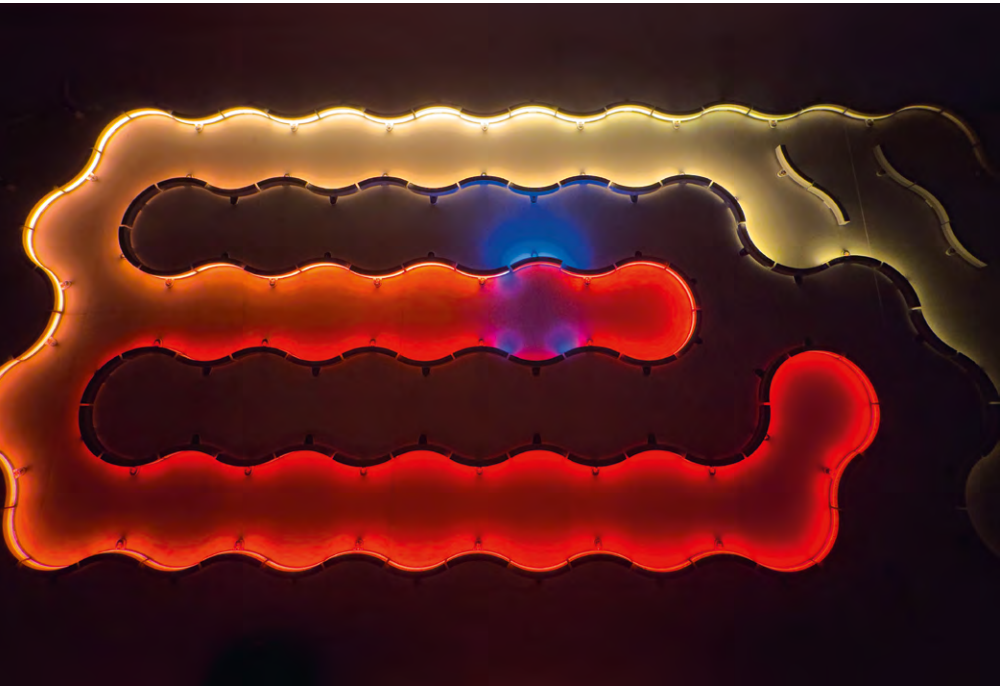
Liquid Tiles unfolds as a dynamic interplay of geometry, movement and sound. Based on a modular system, algorithmic rules continuously generate new compositions that oscillate between order and randomness, structure and organic growth.

Each of the six patterns – Fuller, Spaghetti, Feather, Snake, Kaleidoscope and Duality – follows its own behavioural logic, creating a distinct atmosphere and spatial experience. Complex cellular structures emerge like living organisms, luminous lines weave and mirror one another, symmetries bloom and dissolve, and choreographed entities interact across the matrix. Visual processes are directly translated into sound: light becomes audible, movement becomes rhythm. What unfolds is not a static image, but a continuously transforming audiovisual field, a poetic exploration of system, emergence and perception in space.

↓ Feather

Photos: Helmut Henkensiefken

Fuller



↑ Fuller

An algorithm periodically generates compositions of closed shapes. As it searches for ways to fill the canvas, it produces a never-ending field of combinations that reveals the versatility and flexibility of the modular system. Large structures can emerge that recall natural phenomena – corals, fungi, microorganisms – while smaller interlocking cells gather into shifting constellations. At times, the behaviour even suggests characters from an extraterrestrial script. From a simple set of rules, complexity and emergent beauty unfold through permutation.

A musical Euclidean sequencer activates these forms rhythmically, turning the composition into a visual score. Each shape carries an associated sound whose pitch relates to its scale, larger figures resonate with lower tones, while smaller ones produce higher voices, creating a layered audiovisual pattern.

Spaghetti

↑ Spaghetti

1. Take a few boiled strands of spaghetti and throw them across the table.
2. Place a couple of mirrors and reflect the resulting composition.
3. Make the strands shine and cast light to the sides.

You will get the most delicious and radiant dish for your hypnotic dreams. This behaviour is driven by controlled, periodic randomisation of the arc angles. All elements shift simultaneously, yet the algorithm favours local continuity, encouraging the formation of long, meandering zigzag paths – the "spaghettis". These strands weave across the canvas and, through mirroring, transform apparent randomness into a loose and playful symmetry. A dreamy soundscape follows the stretching and realignment of these luminous lines, accompanying the slow cooking of this ever-changing geometric dish.

Feather

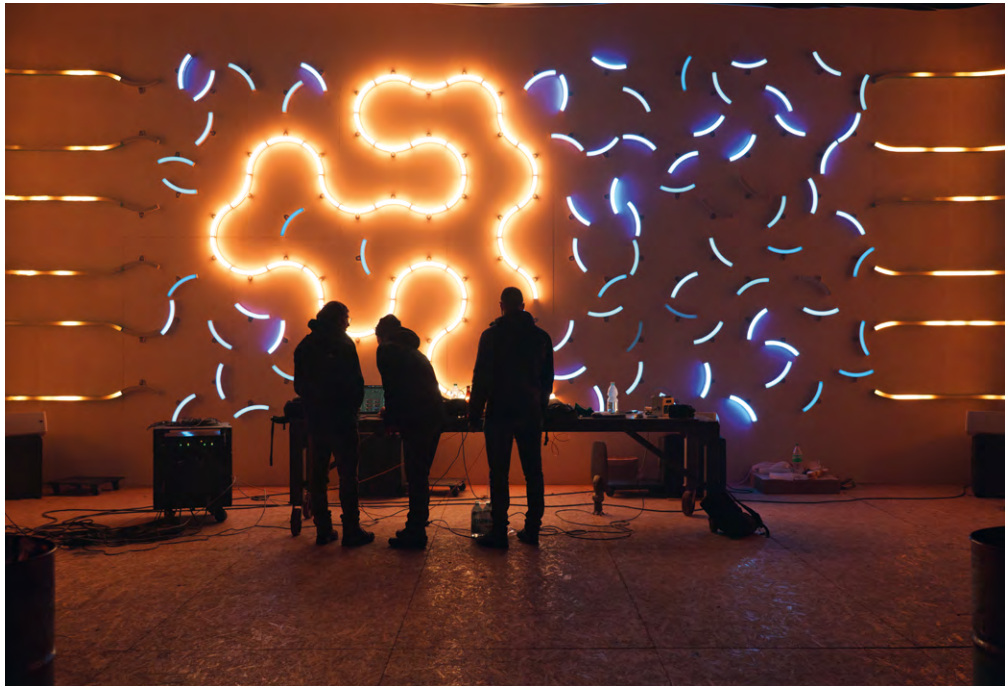
↑ Feather

A soft, continuous motion spreads across the matrix as if guided by an invisible wind. The arcs no longer behave as individual elements but as parts of a shared surface, bending and aligning through smooth gradients of change. Patterns emerge that recall feathers, fish scales or fields of grain set in motion by air currents.

This behaviour is generated by two-dimensional Perlin noise applied simultaneously to rotation and colour. Small local variations propagate into larger coherent drifts, producing flow-like structures similar to those found in natural phenomena such as fluid dynamics, animal camouflage or morphogenesis.

The sonic layer is derived directly from the same vector field. Variations in intensity, velocity, orientation and luminosity are translated into sound, so that every ripple in the visual flow leaves an acoustic trace. What we perceive is not an image accompanied by music, but a single evolving phenomenon expressed through two sensory domains – an audiovisual organism continuously reshaping itself in time.

Snake



↑ Snake

A path assembles itself arc by arc, forming a growing zigzagging body that navigates the matrix like a curious creature. Each new segment attaches at the head, extending the chain while carefully avoiding collisions with its own body or the limits of the canvas. The system continuously searches for a valid continuation, turning spatial constraint into a playful process of growth.

When no further move is possible, the structure reaches its limit – the game is over. The canvas clears and a new snake is born, restarting the cycle of emergence and expansion – a gentle nod to early arcade logic.

Kaleidoscope

↑ Kaleidoscope

A rotating kaleidoscopic pattern unfolds across the canvas, continuously recombining itself into fleeting constellations of flowers, stars and radiant geometries. Symmetries appear, dissolve and reassemble in a slow, hypnotic drift, as if the surface were endlessly folding onto itself.

Moments of visual convergence briefly reveal the precise geometric structure underlying the apparent complexity before dissolving again into motion – a balance between order and ornament, mathematics and perception.

Duality

↑ Duality

A symmetric choreography of two light and sound entities explores the limits of their relationship. They move across the canvas seeking one another, expressing a desire to communicate and interact. What unfolds is a narrative that echoes human relations, where balance, symbiosis and symmetry guide this algorithmic expression of duality.

Driven by randomness and a complex set of rules, the story is told through an emotional journey of light, colour, movement and sound.

Lightnet Headquarters Germany
Lightnet GmbH
Zollstockgürtel 65
50969 Köln
+49 221 22 25 26-0
info@lightnet.de

lightnet.de