

Origin

A living digital-audiovisual ecosystem

Philmo, 2023 — vanilla JavaScript & Web Audio API

Generative music system.

« From primitive patterns to complex living forms shaped by nature and the rhythm of time; our origins lie at the intersection of these forces and constraints playing in harmony to challenge life.

Just like the way a paint spot drops into water and creates a symphony of ripples and sounds in a harmonious disturbance, cells have harnessed their innate creativity to express their identity through color and shape, constantly challenging perturbations.

Bending space and time, this dynamic play between forces and constraints is the foundation of our origins and creativity. Deeply anchored in the primal elements of water, primitive beats and warm colors; An archetype of the emergence of complexity, a fractal pattern that mirrors the play and the beauty of the creative process itself.

Making use of differential growth algorithms and web audio api to generating sounds Origin is a digital generative ecosystem that embodies the interplay of forces under harmonic tensions and reflecting Emergence through the beauty of simple complexity. »

Generating a number (n) cells:

Url + ?blob=n

Lead

Origin is an always-evolving generative artwork in which swarming pixels and sculpted tones co-author an endless choreography. Drawing on differential-growth algorithms, motion physics and frequency-modulation synthesis, the piece explores how delicate tensions between order and chaos can blossom into colour, form and music.

1. Concept

From the first pulse of a sine wave to the branching of a cellular lattice, *Origin* asks where creativity begins. Primitive patterns collide with natural constraints; time warps, ripples radiate, and complexity emerges. This “digital primordial soup” echoes a paint drop spreading through water—disturbance becoming beauty.

2. Visual Engine

1. Agents and Forces

- Hundreds of agents (nodes) carry position, velocity, acceleration,

colour and radius.

- Five simultaneous forces—mutual attraction/repulsion, neighbour cohesion, close-range push, curvature control and a global sinusoidal wave—drive their motion.

2. Differential Growth

- Nodes split along bending segments, adding asperities and yielding fractal-like borders.
- By disabling growth, the system settles into soft, breathing blobs reminiscent of animal markings.

3. Spatial Harmonies

- A hidden grid distorts force vectors, coaxing agents into semi-ordered lattices.
- Multiple paths repel to avoid overlap while a gentle centre-pull keeps the composition grounded.

4. Colour Language

- 68 carefully curated palettes (6 hues each) combine stochastically, generating 400-plus schemes that range from whisper-pale gradients to 2 % neon bursts—an homage to Johannes Itten's contrast theories.

3. Audio Engine

1. FM Synthesis Core

- Five custom frequency-modulation synths (Drone, Pad, Lead, Bell, Stab) house ten oscillators apiece, each shaped by ADSR envelopes.
- A low-frequency modulator bends carrier pitch, adding warmth and motion.

2. Effects Chain

- Hand-rolled Chorus, Delay and Ping-Pong Delay nodes widen the stereo field; a master compressor glues the mix.

3. Generative Harmony

- A blockchain-seeded random key and mode spawn scales; chords follow the circle of fifths, then voice-shifted up or down for thousands of possible atmospheres.
- Humanised sequencing nudges note on/off times and varies effect parameters, preventing mechanical regularity.

4. Audio-Visual Coupling

- A real-time FFT reads master amplitude; its data amplifies the visual sine-wave force, so every kick, swell or silence ripples the canvas.

4. Technical Notes

- **Stack** Vanilla JS, HTML5 Canvas, Web Audio API.
- **Maths Toolkit** Vector class for dot/cross products, Euler integration,

sinusoid tables.

- **Interaction** Press “Start Oscillators” to launch audio; append ? blob= n to the URL to spawn n cells.
- **Performance** Physics and audio run on separate threads to maintain 60 fps visuals and glitch-free sound.

5. Experience & Reflection

Watching *Origin* is like peering through a microscope while wearing headphones tuned to the cosmos: shapes cluster, drift apart, then re-knit in spirals; bass drones pulse beneath glassy bells; colours mutate from earthy ochres to electric magenta. In this interplay of forces and constraints, disturbance is never destruction—it is the engine of creation.

Origin ultimately celebrates the hidden kinship between code and biology, chemistry and choreography, showing that even in silicon we can still hear the heartbeat of water, pigment and time.