

# The Cybernetic Aquarium

## v. 2.0 - Microbiota

A traditional household aquarium is an encapsulated alien world brought into our living room, providing us with a mix of tranquility and fascination. The Cybernetic Aquarium uses the aquarium motif to explore an equally alien world, an abstract cosmos of algorithms, and mathematical objects which, when given proper conditions, can provide us with an alternative version of biological creatures.

The first version of the Cybernetic Aquarium used fundamental graphic elements - points, lines, and circles - which moved in simple ways and self-assembled to form animated molecules.

In this new version, “swimmers” have a rudimentary genetic capability which can generate a variety of limbs. Their social interactions consist of chasing each other around in endlessly entertaining ways. “Wavers” provide a pleasant background accompaniment.

See inside for details!

**Left mouse button: select swimmer**

**Right mouse button: kill selected swimmer**

# Swimmers

Each swimmer is born as a dot, headed in a random direction. It grows to its full size and then begins to interact with its fellows. This nature of this interaction is nothing more than heading in the general direction of its nearest neighbor. That neighbor, however, is in hot pursuit of its own neighbor, avoiding the one pursuing it. This simple pattern results in an endless stream of interactive hijinks, with creatures coming together, coming apart, jostling each other, flailing their limbs as they change direction, and sometimes forming little caravans that look like compound organisms.

A swimmer has one or more limbs and a pulsating, translucent halo. If there is one limb, it will jut out the back like a little wagging tail; if two, they will be symmetrical and flap like wings. More limbs will arrange themselves in radial pattern, like a starfish. The color of the halo is randomly assigned at birth and serves merely to distinguish creatures one from another.

Should a swimmer venture off the edge of the screen, it dies. The user may select and kill a creature for whatever reason it deems fit (this is in fact the only interactive option a user has). When enough deaths accumulate, the System picks a random on-screen swimmer to give birth to a burst of replacements, enough to replenish the population.

These replacements, however, are not clones of the selected swimmer. Each swimmer has digital genes that store the numeric values of its various properties - size, number of limbs, limb sway rate, and so forth. Any offspring will inherit those values, but the values will be similar, not identical, to those of its parent. Most new values will be close to its parent's, and a few will be on the farther ends of the spectrum.

A swimmer's combination of genes, along with its randomly-assigned color, gives it a unique identity and personality. Some are fidgety, others serene; many are comical, others plain. Since the limbs are purely ornamental, all combinations have an equal chance at survival (assuming that they are not so annoying as to incur the wrath of the kill button).

Great diversity is possible in this Eden-like environment. There is no competition for survival, unlike the biological world where individuals within a species are virtually indistinguishable because they are the “most fit.” for a given environment.

Survival requirements in this environment are quite minimal, consisting only of:

- Stay on the screen
- Do not cause the user to invoke the kill switch.

Of course, the creature has no choice in either of these: falling off the screen is a side-effect of moving in a given direction, and annoying the User results from an unfortunate combination of genes. An example

A few swimmers have an eye-like organ which appears to endow it with intelligence, or at least the capability of observing its surroundings, although this is mostly an illusion.

## Wavers

The second species in this aquarium is a feathery creature that drifts down from the surface as a tiny seed until it detects a bit of scenery. It then attaches itself and begins to grow a single, swaying limb. The limb, as it grows, adds a pair of waving limbs at each segment. Instead of a creature growing limbs, each limb grows creatures. The creatures are quite specialized: they consist only of a minimal body and two waving limbs. Each one is descended from the previous one, and so it shows minor variations. Researchers anticipate that this type of compound creature will evolve considerably in the next incarnation of the aquarium.

# Notes

Programming done in-house by Jim Stewart, using Processing 3.0

Background and foreground scenery scanned from acrylic paintings in the Biomorph Abstraction series “Up from the Primordial Ooze” by the same Jim Stewart

The Cybernetic Aquarium is a product of the Zymoglyphic Animation Laboratory, a department of the Zymoglyphic Museum, founded and curated by JS.

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