

Holon Loosely

Gary Singh , San Jose, CA, USA

For two weeks in August of 2023, the waterfront docks in Melbourne, Australia, welcomed 130 cybernetic solar-powered “creatures” equipped with microphones, speakers, lights, photovoltaic cells, and on-board computers. During the day, the sun filled the creatures with energy. At nighttime, they communicated with each other via sound and light (see cover and Figure 1). Any biological species in the vicinity—birds, insects, or even humans—were transformed into observer/participants.

Melbourne’s Now or Never Festival commissioned Jon McCormack, a computer science professor at Monash University, to build the cybernetic creatures with his team at SensiLab, an interdisciplinary academic research compound he founded and still directs at Monash (see Figures 2 and 3).

McCormack discusses various other AI-based projects from his decades-long career in this issue’s Art on Graphics article, but for the waterfront project, titled “Holon,” he took inspiration from organizational principles detailed in the 1967 Arthur Koestler book, *The Ghost in the Machine*. A Holon is something simultaneously a whole in of itself, but also part of a collective networked whole.

FORM AND FUNCTION

The title creatures in the installation, the holons, performed different functions. They either generated sounds based on their surrounding environment, collected their own favorite sounds of those already generated by the other holons, or even disrupted the processes already unfolding between their counterparts. The “composer/generators” preferred to make sounds, sometimes out of their own volition. The “collector/critics” listened to those sounds, chose which ones they preferred, and then passed them on. The “disruptors” acoustically transformed the sonic environment in various ways to disrupt the exchange between the composers and the critics. While each was a separate entity, the cybernetic creatures, the

holons, together created the emergent behavior of the whole work as an audiovisual installation.

“The idea is because they’re like a hive, a collection of creatures, and they’re intermixed together, this complex interaction between composition and criticism, each tries to sort of become a better critic and a better composer, so they change and they evolve over time,” McCormack said.

As an art installation, Holon functioned like a self-organizing system, an interactive, constantly evolving environment, harkening back to a more old-school era of AI, a more open-ended, frontier type of collaborative-art-research mentality. One felt transported back to the days when scientists, plastic artists, hackers, and technologists, or anyone who did not fit in anywhere else, all pooled their resources in the same labs or think tanks together.

SensiLab is exactly that type of facility. McCormack started the lab due to the siloed nature of academia. Holon was one out of many projects.

“I kind of grew up with this idea of emergence and bottom-up intelligence rather than reverse engineering the human brain kind of intelligence,” McCormack said, emphasizing that such themes appear in much of his work. “Setting up those kinds of interesting connections, that’s where the intelligence starts to emerge from. So rather than it being dictated from the top down, it’s much more emergent, and bottom-up, and therefore, I think, more interesting and probably less predictable in a way.”

EMERGENT LOCATIONS

Originally, Holon was supposed to be installed in an alleyway, providing a much more intimate human-scale experience with hundreds of techno-organisms picking up every possible sound in the cramped urban space, birds, animal life, cars, or what have you. The alley later became unavailable, so the festival organizers chose the waterfront location instead, a massive area down at the docks, where century-old pylons have been sitting in the water forever—McCormack even calls the area a “wasteland”—so the team redesigned the project accordingly.

The installation was a success with the locals living in the nearby residential towers. After the



FIGURE 1. *Holon* when viewed at nighttime, courtesy Jon McCormack/SensiLab, Monash University.

daylight disappeared, once darkness descended, the holons became “alive,” pointillistically dotting the noir landscape with bright lights and sounds. For the duration of the installation, many locals strolled by and even returned later or the next day once they noticed the evolution of the system. They began to understand the installation as a temporary environment assimilating with the larger, permanent environment.

“You would get people actually starting to stop regularly at different times, particularly at sunset, where it would transition from more listening and quieter sounds to birds at the end of the day all coming together and nesting, and they start squawking and making noise,” McCormack said. “So I think that it was something that rewarded a longer term engagement with it rather than just, ‘This looks interesting, wow, it’s a great Instagram photo.’”

As a concept, the holon has appeared in all sorts of disciplines. Back in the 1990s, the legendary Japanese architect Kisho Kurokawa articulated his philosophy of symbiosis, a nondualistic approach to the part and the whole, in which the holon could be applied to urban spaces, human activities, social structures, neighborhoods or the relationships between the state and individual self-governing bodies. For example, Tokyo was a holon of 300 cities, he wrote.

Holon—the installation McCormack designed and built at SensiLab—feels like a necessary AI adventure, going back to the days when people



FIGURE 2. Building the “creatures” for *Holon*, courtesy Jon McCormack/SensiLab, Monash University.

talked about emergent behavior and open systems, rather than spewing alarmist clickbait to argue whether or not AI will kill off DJs, painters, or legal assistants, that is, the days when linguistics, biology, and audio engineering all emerged in the same interdisciplinary projects.

SYMBIOTIC OEUVRE

Holon, the project, can be viewed through many different lenses. One can wax nostalgic about the 1990s era of artificial life discussions, or bring it to the current day, highlighting, perhaps, that everything really is connected.

“A lot of it was influenced by the field of acoustic ecology as well,” McCormack said, rattling off the work of Bernie Krause and even some others at the



FIGURE 3. Building the “creatures” for *Holon*, courtesy Jon McCormack/SensiLab, Monash University.

Max Planck Society in Germany. Even if various works in the past are not directly related to the Holon project, the influence reverberates. Clearly, the whole and the parts are indeed symbiotically related.

"It's a lot of ideas that are quite old ideas," McCormack admitted. "And of course, the Arthur Koestler book and those kinds of things, all things we've been interested in for a long time kind of came together in

this work to create something that has quite a strong physical presence just because of the scale of it."

For more of what emerges in McCormack's oeuvre, see this issue's Art on Graphics article.

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