Artificial Life—Artificial Personality

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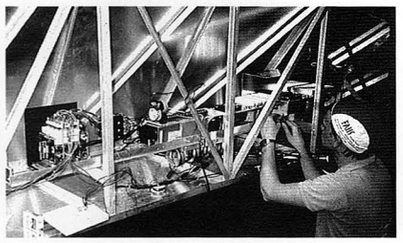
The position of the architect in contemporary practice is a difficult one—utilizing technologies that have remained essentially unchanged for decades to implement the program of those with power or money. Are you excited yet? Many have found solace in the evolutionary development of that perfect roofing detail, or in the latest formal gymnastic, or theoretical convolution.

As an antidote, architects must break the hermetic seals of their education and social position to venture into the realm of those fortunate enough to be doing some interesting work and observe how it is done. They must sift through these labors in an effort to find two things—first, the technological innovations that will allow for the development of architecture to the end of the century, and second, the techniques that are used by other disciplines to undertake technological development.

In the last three decades, the extraordinary progress that has been made in the electronics, materials science, defense, and aerospace fields has yielded a wealth of new materials, engineering principles, and computer technologies with architectural implications. It is now possible to conceive of an architecture that is composed not only of "skeleton" (structural frame) and "skin" (cladding or curtain wall), but one that incorporates "nerves" (fiber-optic sensors), "muscles" (shape memory alloys, electrorheological fluids, piezoelectric ceramics, linear actuators, and motorized jacks), and a "brain" (microcontrollers, neural nets and artificial intelligence). This is an architecture that is capable of sensing the structural, environmental, and programmatic forces acting on it and to interactively respond in real-time. The application of the techniques of artificial intelligence suggests that these structures are capable of learning. More than simply a technological innovation, this characterization of architecture represents a new paradigm within which to undertake our work. The task of architects and designers is the creation of intelligent artificial life-forms.

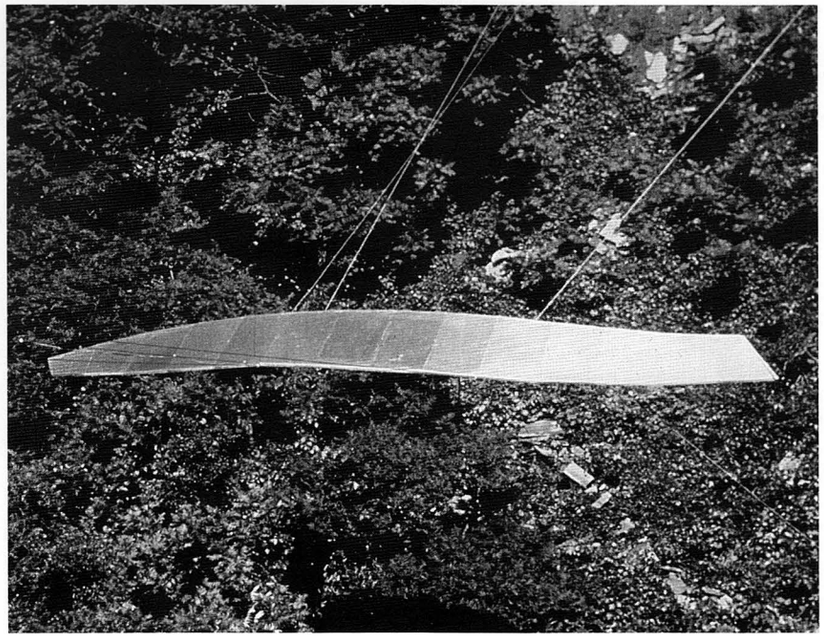
However, intelligence is not an innate property of architecture. What is currently considered intelligent behavior in buildings is due to machines and not to brains. The level of sophistication attained is minimal. Efficient but dumb sliding doors and robotic window washers promote both the limp passivity of the human and the doltish subservience of the architecture. Networking a few thermostats in a tall building may be intelligent mechanical design but it does not substantially increase the IQ of the building itself. The building industry, not unlike the narrow pre-occupations of the first experimental psychologists, seems blindly obsessed with manipulating the rudimentary functions of architectural behavior instead of developing a full understanding of the architectural being of which intelligence is a limited part.

K/K Research and Development has undertaken the construction of a project within the biological paradigm discussed above. The project was constructed at Artpark in Lewiston, New York between June 12, and July 9, 1990.



Skeleton: This consisted of a 28-foot warped triangular space frame of extruded aluminum with welded and mechanically fastened nodes. Three main support cables passed through steel pipe incorporated into the frame to anchorages at the top of the adjacent cliffs. Additionally, seven smaller cables ran to concrete-filled drums buried in the rock rubble below to stabilize the work in the high winds of the area and to position it at the proper angle of dangle.

Skin: The project was sheathed in gray acrylic and break-formed sheet aluminum bedded in silicone and screwed to the frame.



Senses: Infrared motion detectors attached to the work were oriented to intercept approaches to the work and to sense directly below as well.

Intellect: A computer was assembled from a number of proprietary modular I/O boards driven by an Intel 8052ah microcontroller. Programming was written in Basic.

Muscle: Output from the computer was sent to fifteen automotive power antennae, three fog lamps, and a number of truck running lights.

Metabolism: Three power supplies converted standard electrical service to the half kilowatt of 12-volt DC power required to drive the computer, associated electronics, sensors, and automotive equipment.

Personality: Just as artificial intelligence can be considered machine-simulated intelligent behavior, so artificial personality is a machine-simulated mode of behavior. It is the relationship between the stimulus and the nature or manner of response that leads to the attribution of intentionality—this is a machine with an attitude. In order to facilitate this perception, we manipulated the timing and sequences of activity in order to convey a number of psychological states—arousal, defensiveness, aggression, paranoia, boredom, and confusion.

The work is suspended between two cliffs created by the demolition of a tunnel serving a defunct rail line that ran along the gorge of the Niagara River at Lewiston. A trail now occupies the old right-of-way effectively confining the approach to the piece from one of two directions. When the motion detectors sense someone approaching the work, the onboard computer responds by projecting the automotive power antennae from within the aluminum body, by activating fog lamps, and/or a number of the running lights positioned along the piece.

Sixteen preprogrammed responses are provided for the firing of any sensor and for all combinations. As the work is directional, it responds differently to an approach from the front than from behind, than from two directions simultaneously, or from below. Additionally, loops in the program read the sensors intermittently to detect changes in position. If watched passively, the work acclimates to one's presence and goes dormant, reviving with the movement to leave. A group of people milling around below the work keep all sensors activated, resulting in a most agitated response.

This choreography is central to building the perception that one is being watched. The nature of the change in response to one's pattern of movement leads not only to an understanding of the personality of this "thing," but its attitude, by its nature, becomes a commentary.

At Artpark, we produced a work of rudimentary intelligence. That is, one that was capable of taking a number of courses of action based on the status of environmental sensors. This standard stimulus-response mode of operation is appropriate to a machine, not because it is a valid psychological theory, but because behaviorism is a mechanistic one. This project is no grand-master chess challenger and represents the field of artificial intelligence only at the most primitive level, but it attempts to slip out of the Pavlovian leash by proposing a new field of investigation in machine psychiatry: Artificial Personality.

K/K Research and Development asserts that current architecture is a repressed clinical specimen concealing a complex array of latent behavioral features that, once released, would free architecture and individuals from their mutual subordination.

All illustrations from Art Park, Lewiston, NY 1990.