

**Harold Cohen (1928-2016):
The Last six years of a Creative Life
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Abstract

This article chronicles the last six years of a highly creative artist, Harold Cohen--the creator of AARON, the world's first painting machine. This documentation, based primarily on Cohen's personal correspondences with the author, contains important, so far undisclosed, information on Cohen's evolving theories of art, creativity, and the human machine interface that is of interest to researchers of machine creativity, art historians, and museums.

Keywords. Machine creativity; Chinese painting; human and machine interface; semiotics, intentionality in art.

Harold Cohen, artist and pioneer in the field of computer-generated art, died on April 27, 2016 at the age of 87. Cohen is the author of AARON, perhaps the longest-lived and certainly the most creative artificial intelligence program in daily use. Cohen viewed AARON as his collaborator. At times during their decades-long relationship AARON was quite autonomous, responsible for the composition, coloring and other aspects of a work; more recently, AARON served Cohen by making drawings that Cohen would develop into paintings. Cohen's death is the end of a lengthy partnership between an artist and an artificial intelligence.

Cohen grew up in England. He studied painting at the Slade School of Fine Arts in London, and later taught at the Slade as well as Camberwell, Nottingham and other arts schools. He represented Great Britain at major international festivals during the 60's, including the Venice Biennale, Documenta 3, and the Paris Biennale. He showed widely and successfully at the Robert Fraser Gallery, the Alan Stone Gallery, the Whitechapel Gallery, the Arnolfini Gallery, the Victoria and Albert Museum, and many other notable venues in England and Europe. Then, in 1968, he left London for a one-year visiting faculty appointment in the Art Department at the University of California, San Diego. One year became many, Cohen became Department Chair, then Director of the Center for Research in Computing and the Arts at UCSD, and eventually retired emeritus in 1994.

Leaving the familiar, rewarding London scene presaged a career of restless invention. By 1971, Cohen had taught himself to program a computer and exhibited computer-generated art at the Fall Joint Computer Conference. The following year, he exhibited not only a program but also a drawing machine at the Los Angeles County Museum. A skilled engineer, Cohen built many display devices: flatbed plotters, a robotic "turtle" that roamed and drew on huge sheets of paper, even a painting robot that mixed its own colors. . . . Although AARON went through an overtly representational phase, in which images were recognizably of people or potted plants, Cohen and AARON returned to abstraction and evocation and methods for making images that produce cascades of almost-recognition and associations in the minds of viewers.

"Harold Cohen is one of those rare individuals in the Arts who performs at the highest levels both in the art world and the scientific world," said Professor Edward Feigenbaum of Stanford University's Artificial Intelligence Laboratory, where Cohen was exposed to the ideas and techniques of Artificial Intelligence. "All discussions of creativity by computer invariably cite Cohen's work," said Feigenbaum.

AARON's images and Cohen's essays and videos can be viewed at www.aaronshome.com.

(excerpt from Harold Cohen's obituary written by Paul Cohen, downloaded on 30 July 2019 from <http://www.aaronshome.com/aaron/publications/Harold-Cohen-Obituary-by-Paul-Cohen.pdf>)

What the psychologist Martin Lindauer (2003) says about artists with a lifelong career in creative work applies to Harold Cohen, namely that excellence in old age is possible, and that changes with age can be for the better. This paper documents this change in the last phase of Cohen's creativity. The documentation is based primarily on his email correspondences with the author, corroborated with published works.

Cohen's Last Phase of Creativity

I started an email correspondence with Cohen in 2004, in order to pursue a theoretical investigation into creativity. Our initial communication was not very productive and eventually fizzled out in 2005. After a hiatus of five years I tried again. In the following, all email communications with Cohen (including face to face conversations that were later verified in email correspondence) are in *italics*, and dated as month/day/year.

2010. I resumed our conversation toward the end of 2010. In mid-2010, Cohen made one major innovation--"perhaps the biggest single break-through in my career after meeting my first computer" (Brown, 2011, p. 35)-- he picked up

the paint brush again, after leaving the coloring job to AARON for over a decade. This event became the focus of much of our discussions in 2011.

As I resumed my research project with Cohen on creativity, I decided to be more systematic-- and it worked. I invited Cohen to reflect on his past and present creativity that spanned over four decades. To get some soul searching reflections going, I further invited him for a dialogue, via email exchanges. Cohen accepted the invitation, saying that "*important, difficult questions force me to think through what I'm doing in a way that's hard to achieve in isolation*" (8/20/2010).

2011. To get the conversation started, I applied three models of the mind-- the extended mind hypothesis (Clark, 2008) in contemporary philosophy, the Ancient Chinese notion of *lei*, and the semiotics of Charles Sanders Peirce-- to an analysis of Cohen's talk given at the Orcas Center (Cohen, 2010). A draft was sent to Cohen, who had no prior knowledge of the theoretical frameworks of my analysis, but thought that the analysis was "*persuasive, and indeed, clarifying*" (12/3/2010). This set the stage for an extensive dialogue between us. In the subsequent back and forth exchange through emails, my analysis was continuously revised by incorporating Cohen's feedback, and by consulting relevant publications on his work. The final version of the analysis was reached, when his comments become redundant. Cohen's response to my endeavor was: "*I find it hard to address my own developments clearly, and you've addressed those developments in a much broader context. Remarkable!*" (5/10/2011).

Our joint formulations of his creativity resulted in two publications: an essay I wrote for the catalog of his Calit2 exhibit (Sundararajan, 2011), and a journal paper written a few month earlier but published much later (Sundararajan, 2013). Concerning my essay, Cohen wrote in the acknowledgments of the Calit2 catalog (Cohen, 2011):

It is a rare and happy event to be told something about my work that I didn't already know. The title of this exhibition [Collaborations with my other self], and its formulation, owes its conception to a searching, year-long email correspondence with Dr Louise Sandararajan. . . . I am in her debt for her unfailing patience and persistence in exploring currents in the development of my work that had long gone unconsidered. (p. 47)

Concerning my journal article (Sundararajan, 2013), Cohen wrote to me upon receiving an e- copy of it in 2014:

Thanks for sending the final published paper. I downloaded it a few minutes ago and started reading it; and found it difficult to stop. Very good stuff, Louise, and by far the most valuable and searching treatment of my work EVER. I am so grateful to you. (4/27/2014)

In the follow sections, I give a synopsis of our joint formulation of Cohen's creativity. Our discussion revolved around the relationship between Cohen and

AARON. One of our earliest email exchanges I (LS) had with Cohen (HC) went as follows (12/27/2004):

LS: *What's your relationship with AARON?*

HC: *well, I'm not sure there's a term for it. I doubt Bush would let us get married, though if it was called Annabelle he probably wouldn't notice.*

LS: *Would it be appropriate for me to wish him a happy new year?*

HC: *him?*

The various analyses I introduced to Cohen were attempts to shed some light on this phenomenon that does not have a ready-made term for.

Centrality of Dialogue

Cohen was emphatic about the need for dialogue between the programmer and the program. He (Cohen, 2009) wrote: “‘cognitive creativity’ is a property . . . of the relationship between program and programmer; because it is only in the dialog that can develop in that relationship that the transition from human purpose to machine implementation becomes possible” (p. 8). He went on to say: “Lacking that dialog, we are reduced to defining the machine as an imitation human being; a dubious undertaking, in my view, and one having little or no bearing on the issue of creativity” (pp. 8-9). By 2010, dialogue and intimacy became inextricably connected with machine creativity in Cohen's writing:

Creativity . . . lay in neither the programmer alone nor in the program alone, but in the dialog between program and programmer; a dialog resting upon the special and peculiarly intimate relationship that had grown up between us over the years. (Cohen, 2010, p. 9)

It may come as no surprise then that the need for dialogue with AARON led to his major innovation in 2010—he picked up the paint brush again to paint over the background of AARON's drawings. One version of the 2010 innovation went as follows: As a programmer, Cohen's goal had always been program autonomy (Cohen, 2009). But in 2009 when a newly developed and very general form generator brought things very close to that goal – AARON could now handle color, forms, and composition all on its own– Cohen suffered something of a crisis. He (Cohen, 2010) wrote: “I felt that my dialog with the program, the very root of our creativity, had been abruptly terminated” (p. 12). He said in the interview with Sheldon Brown: “I suddenly got this feeling it didn't need me anymore. It was almost like I was faced with a divorce or something” (Brown, 2011, p. 38). How to re-establish that all-important dialog? This was the question that “*led to a resumption of the dialog – having AARON provide an ‘underpainting’ to which I could then provide qualities the program couldn't provide*” wrote Cohen in his email correspondence (3/9/2011).

To interpret this phenomenon, I tried three models of the mind. The extended mind hypothesis (Clark, 2008) was the least successful (for details, see

Sundararajan, 2013), hence shall not be repeated here. The other two theoretical frameworks--the ancient Chinese notion of *lei* and the semiotics of Charles Sanders Peirce--were well accepted by Cohen, and will be applied in my interpretations of Cohen.

The ancient Chinese notion of lei. In Western metaphysics, there is a deep seated subject and object dichotomy, a dichotomy well-articulated by the Kantian dictum that “We are subjects thinking about objects” (Freeman, 2000, p. 117). How can the mind relate to the object of its thought, or the program it has developed, as an equal partner? Cohen did just that. In so doing Cohen had crossed the ontological divide between self and non-self, human and machine, or programmer and program. This proclivity to cross ontological boundaries is evident in his claim (Cohen, 2009) that “computational creativity” implies “some as-yet undefined amalgamation of human and non-human . . . a new kind of entity; one in which the developing creativity of the one manifests itself in the superior performance . . . of the other” (pp. 1-2).

I suggested to Cohen that this phenomenon can be understood in the framework of the Chinese notion of *lei*. *Lei* literarily means category, but is more than categorization, as it pertains to the intrinsic affinity between things of the same kind (Munakata, 1983; Sundararajan, 2009). What are the things that belong to the same kind as me? It depends on the extent to which I am able to extend my being. This is the logic of *lei*, which resonates well with Cohen's imagery of the cyborg that seeks to merge two entities—human and machine-- across the ontological divide. He wrote in his email:

Sometimes I think I'm a precursor for the coming Cybrog [sic.]-- not in the sense of having mechanical parts to the body, but in the sense of having computational implants in the brain, only my implant is sitting on my desk.
(7/10/2011)

He gave a more elaborate account of the cyborg in his interview with Sheldon Brown three months later:

... I'm a prototype for the coming cyborg, not in the sense of having mechanical parts to my body—I already have that, and they don't work very well—but in the sense of having implants in my brain that are capable of doing things that I couldn't do with the other parts of my brain. The only difference is that my implants aren't in my brain, they're sitting on my desk. But I feel very connected in my relationship with the program now. (Brown, 2011, p. 39).

From Interpersonal to intrapersonal Dialogue

Imagery of the cyborg paved the way for a transition in Cohen's relationship with AARON from interpersonal to intra-personal dialogue. When the machine was

transformed from an external entity into an embodied, embedded entity—the transplant-- relationship with AARON likewise became intrapersonal, as evidenced by the Calit2 exhibit, in which Cohen referred to AARON as “my other self.”

For this transition, Cohen (HC) credited my theory of self-integration in his interview with Brown (SB) at the Calit2 exhibit:

SB: “So as AARON has been developed over time, how do you consider this notion that there is this other self embodied in this system that you’ve been creating?”

HC: “I’ve spent a large part of the last year in correspondence with a psychologist, Louise Sundararajan, who has been building a case that my involvement with the program has had less to do with productivity than it has had to do with creating an ‘other’ that I could discourse with.. . I think she’s right.” (Brown, 2011, p. 36)

The argument (for details see Sundararajan, 2013) I made to Cohen was borrowed from Charles Sanders Peirce. Along with a long line of thinkers from Hegel to George Mead, Peirce stipulates that the self-to-self dialogue has a triadic structure that is anchored on three points: self-other-self (Wiley, 1994). This triadic formulation of the internal dialogue of thought suggests that the self needs to loop through an other in order to come home to itself. This third term—the other, I suggested, was AARON. The creation of AARON for better self-integration is not a far-fetched idea. Boden (2009) also noted that “. . . Cohen—already a highly successful abstract painter—first turned to AI techniques in the hope of understanding his own creativity better.” (p. 31).

When asked by an anonymous reviewer of my manuscript (later published as Sundararajan, 2013) concerning the reasons behind the name AARON, Cohen came up with this account of self-integration (10/12/2011) (for an unabridged version, see Sundararajan, 2013, pp. 147-148):

In attempting to externalise [sic] the art-making side of my “self,” I was separating two aspects of that self. The program had to be written, and the part of self writing the code – the rule-giver – appeared to be quite different from the part – the artist -- that actually made the art.

I've long been intrigued by the curious parallels between my own experience and the story of Moses and Aaron. Moses, you will recall, goes up the mountain to receive God's commandments concerning proper behavior for the Jewish people. In his absence the people revert to animism and idolatry. To satisfy their demands, Moses' brother AARON fashions a golden calf, and Moses descends from the mountain . . . to find the people worshipping the sculpture. He's furious . . . For Aaron was reserved the special punishment that he would never enter the Promised Land. . . .

Eventually, slowly, Moses and Aaron develop a way of working together,

each contributing his/its own unique characteristics, his/its own special abilities, to a re-unified single whole. Whether or not he/it makes it to the border, Moses/Aaron continues the journey to the Promised Land in one piece.

(Warning: don't trust any of the tales I tell about Judaism; not because I'm making them up, but because I haven't heard them or thought about them in fifty years.)

He added later: *"I lost touch with the sources in my late teens. But the Moses/Aaron story has always had a fascination for me, not just now"* (10/15/2011).

Transitioning to a New Phase

Like the proverbial screw that gets multiple turns, Cohen's account of his 2010 breakthrough had another version: In his Calit2 interview, Cohen talked about spending six months working on a project for the public art commission, which he did not get. He was left with little panels done on white and gray backgrounds:

I was sitting in the studio feeling frustrated as hell and getting increasingly irritated by these neutral backgrounds, and I thought, "I'm going to get rid of those stupid backgrounds." I dug out my paints, which had been in storage for 10 years. . . (Brown, 2011, p. 35)

As an attempt to correct the source of his discomfort by painting over the background, Cohen found that he had effected a startling transformation to the images, prompting a complete rethinking of how his images came into being in the first place (personal communication, 10/2/2011).

What is an image? Cohen (1979, 2009) had been thinking about this question for a long time. To Cohen an image was not representation so much as "standing-for-ness" (Cohen, 2009). Cornish (2011) explains: "Cohen aimed at what he called 'standing-for-ness,' an evocation of perhaps unnamable aspect of the world, rather than a direct representation of a specific part of it" (p. 5). More specifically:

For Cohen a painting has never been just a collection of marks or a decorative, exciting or beautiful object but had to be involved with 'conjuring meaning'. His career, both before and after his adoption of computers, has been driven by a belief that whilst images must have their own structure or internal logic, their 'primitive magic' is that they are able to stand for things that are not literally present, even if these things are not directly recognizable as part of the wider visible world. (p. 4, emphasis added)

Semiotics. I pointed out to Cohen that a similar idea was found in Terrence Deacon (2010), who claims that information is "dependent on a relationship to something not present" (p. 167, emphasis added):

. . . the imagined significance of a coincidental event, the meaning of a reading from a scientific instrument, the portent of the pattern of tea leaves, and so on, really is something that is not there. (p. 167, emphasis added)

I further elaborated this point (for details see Sundararajan, 2011) with the semiotics of Charles Sanders Peirce (1931-58), who claims that symbolic representations entail a relationship among three terms, (a) the sign that represents something; (b) the object of representation; and (c) the *interpretant*—the mind that interprets, or makes inferences by determining the relation between (a) and (b). Note that while (a) is something present, (b) is an absence, which, thanks to (c) the *interpretant*, is inferred to be what (a) is about. Cast into the Peircean framework, an artistic image corresponds to the sign (a), which does not stand in a one to one correspondence kind of relationship to the object of its representation (b), because (b) is an absence—something unnamable, which cannot be directly represented, but can only be evoked, thanks to the inference making capacity of the mind as *interpretant* (c). Cohen agreed with this formulation of the image.

The void. The 2010 breakthrough had yet a third version: In his talk at Orcas Center, Cohen (2010) stated that “in the final months of last year [2009] I had been making a conscious effort to simplify the imagery, with the result that the individual elements were getting larger and, consequently flatter” (p. 14). This exposed the gap between meaning and intention, due to the fact that AARON's images are untouched by hand. Cohen explained that intentionality is usually associated with the manipulation of physical materials in conventional image making: “. . . part of the problem with electronic imagery is precisely its untouched-by-hand look; if it wasn't touched by hand, if it shows no evidence of the manipulation of material, then it becomes that much harder to believe in its intentionality” (p. 14). When the image was complex, this gap between meaning and intentionality did not attract attention. Now it did, when the image became simpler and flatter. He wrote: “Whether I knew it or not—and I didn't—that seems to have been the reason for painting over the background of one of AARON's little panels. I was opening the door to the assumption of intentionality in the reading of the image” (p.15).

But why covering up the gap between meaning and intention (by painting over the background)? I asked. To taut the virtue of gaps or absence, I told Cohen about the void in classical Chinese paintings. I pointed out that “. . . the void in Chinese painting consists of a discontinuous presence—presence perforated by absence” (Sundararajan, 2011). I cited George Rowley (1959), a scholar on Chinese art, who wrote: “Such a conception [as the void] has had no parallel in the west, because our concern with actuality has made us emphasize the existent rather than the non-existent so that the sky was a space-filled realm and not a vehicle for imparting a sense of the infinite” (p. 71).

Subsequently Cohen left the background unpainted in three of his works for the Calit2 exhibit. In his Calit2 interview, he gave his explanation:

The shift has a lot to do with the fact that oil painting is at its best when you get light reflected from the white ground underneath. I wanted a kind of clarity that I didn't think I was getting from painting over the underpainting. And that's where we are today. What we'll be doing tomorrow I'm not sure I know. (Brown, 2011, p. 35)

Indeed, in the next few years till his death Cohen went much further with the void. He hinted at this new direction in his comments on the first draft of my essay (Sundararajan, 2011) for the catalog of his Calit2 exhibit:

... just did a first read-through; looks good. I think you're on to something with the part on the background; curiously, even more so in relation to a couple of new paintings I'm just finishing up than to the stuff you know. (10/10/2011)

New Image in the Making

"A new image costs humanity as much labor as a new characteristic costs a plant." (Jacques Bousquet, cited in Bachelard, 1983, p. 3)

Toward the end of 2011, change was on the horizon. This seemed to be anticipated by Cohen in his email to me:

I woke up this morning with a thought concerning your "full circle" characterization of my journey [see Sundararajan, 2011](Really? I had thought. Back where I started?) The story says the Jews took forty years to get from Egypt to the promised land. (Six hours by car?) My AARON began in 1972, which means that Moses/AARON should reach the border next year. A new place? Home again? (11/15/11)

2012. "New work" was mentioned.

I didn't fully understand the significance of the new work either; I'm only now beginning (I think) to unravel it. (1/18, 2012)

The work has moved quite suddenly in an unanticipated direction. Too early to show, and still many unresolved problems. But hopefully I'll have some new pieces to send in a month or so. (5/14/2012)

2013. The transition was complete in 2013, when the void—unpainted canvas—was ubiquitous in all of Cohen's works, a trend that continued till his death. At the same time Cohen had become more articulate about this transition:

I've been meaning to write for some weeks, to tell you about new work, evidently strongly influenced by your observations on the void in chinese [sic] art and our subsequent discourse. The new paintings distinguish between the void -- the unpainted canvas -- and the backgrounds of events that occur in the void. The events are the marks, lines, provided by AARON. The backgrounds are the areas of color which I use to determine for the viewer

how the marks should be grouped -- a bit like naming constellations in a random distribution of stars. Don't have any pictures yet, but I'll send you some in a few days." (4/4/2013)

I'm in the middle of those new developments and I need all the time and brain-power I can hang on to for the moment. (4/5/2013)

The newest work rests heavily on your insights, apropos Chinese landscape, about the difference between background and void. For which I remain deeply grateful. (8/11/2013)

2014. The "new work" continued.

Work is going well, actually -- I'll send you a CD as soon as I get the newest thing photographed -- and I'm giving a lot of thought to how to proceed when (inevitably) I'm no longer able to physically paint. (4/27/14)

The Last Innovation: Finger Painting

In 2015, decreasing mobility led to the innovation of finger painting, which was described by Cohen (2016) in an online paper (available at www.aaronshome.com):

There are three parts to my finger-painting system. The first is the AARON program running in its old home on a a[sic] high-end LINUX machine, and tasked now, as it has been for several years, with making drawings for me to color.

When those drawings have been selected, they are ported over to the second – and central

part of the system, which runs on a Windows machine with two displays . . . One is a

seven-foot touch sensitive screen where AARON's drawings are displayed and where the

program then records the movement of my finger on the surface, my finger "being" a brush of selected size and color. The other is a smaller monitor, which serves as the controller for the entire system. The program stores the data for up to twelve images -- that's equivalent to having twelve partially worked canvases in one's studio – and I can move freely between, and work on, any of the twelve, by clicking on one of the "job" buttons at the top. . . .

Once a painting has been completed, the program generates a Postscript file, which is ported to the third part of the system; a wide format printer, where it will be used to print the image on canvas, ready for stretching. (pp. 1-3)

Cohen first mentioned finger painting in his email of 3/2/2015:

My new work is proving difficult, and getting around even more so.*

**I'm using a 7' touch sensitive screen, going into AARON's space (as it were) to color its drawings. Looks good on the screen, but trying to print what I see there is very hard.*

Cohen explained more fully his difficulties in the online paper (Cohen, 2016): "Some of the colors I can display on my big screen are outside the gamut of the printer; it simply can't produce them from the six "primaries" it uses" (p. 3). These difficulties resulted in a shift of focus: "... I think about color more in terms of color relationships than I had previously" (p. 2), and again: "And in providing myself with a set of tools for this new medium I found I had provided also a new way of thinking about and handling color relationships" (p. 3).

Another consequence of finger painting was a closer relationship with AARON:

It never occurred to me until recently that I had changed the terms of my relationship with my program, my collaborator, in a very fundamental way. Before this new phase, it had always been necessary to bring AARON's contribution out of the program's space so that I could make my own physical contribution – that is, printing its drawings on canvas before I could start the coloring. Now I am working almost entirely in the program's space. Issues of physicality don't arise until the physical limitations of the hardware make that final stage of adjusting color relationships necessary. (p. 3)

These themes were also prominent in an earlier conversation with me on 1/23/16, when I visited his studio and took the following notes, which were subsequently read and approved by Cohen on 2/4/2016:

"Relationship of colors becomes more central than before."

"Finger painting gets past the point where skill is important."

"Conceptual problems become central. The biggest conceptual problem is: What kind of things can be colored? What color relationship goes with the drawing? How color fits in the drawing naturally?"

"Most of the drawings [by the program] are not colored, because I can't figure out how to color them."

"I am only allowed to color what the program tells me is there, leaving the rest to the void."

"Before, computer makes a drawing, takes the output to the domain of physical reality, and physical color is my space, a domain apart from the drawing. Now the whole thing is done in the program domain. This is the most radical work I have done. Color becomes part of the program domain; everything is done in the program domain, resulting in a more intimate relationship between program and programmer."

After reading the notes I took, Cohen added *"The next phase will be more interactive with the program that I have been in daily contact with for 50 years"* (2/4/2016). He repeated the same idea in his paper on finger painting (Cohen, 2016), published online four days later:

It could give rise to a new level of intimacy between my collaborator and myself, our roles freed of the restrictions of drawing on its part and coloring on mine. Or it could give rise to something I can't even conceive of at this moment. Have to wait (no, work) and see. (p. 3)

A Culminating Vision

On my visit of 1/23/2016, Cohen and I left the dinner guests temporarily to go to his studio to take a look at his finger painting machine. When we returned to the dinner table, the conversation was on the discovery of the new planet. Joining at the end of the conversation, Cohen said *"A sprinkle of dust in space, you use a telescope that renders light years away a very short distance—just you and the dust you discovered."* This enigmatic statement kept turning in my mind, so I wrote to him on 2/4/2016 for clarification. In his response on 2/6/2016, Cohen elaborated further on this magnificent imagery:

Astronomical story in full: you scatter dust in some vast area in space, maybe one or two grains per cubic kilometre, Then you step back several light years, build a strong-enough telescope, and what you see is not dust but the Horse's Head nebula or whatever. By analogy, the program generates clusters (like clusters of dust) and it's my job to find the horse's head.

Two months later, Cohen passed away on April 27, 2016. His partner Hiromi Ito wrote to me the next day: ". . . we put his bed in the studio, so he died surrounded by the paintings" (4/28/2016).

AARON: From god to mortal

As the world's longest operating painting machine, AARON was meant to be god-like: *"Why do I want AARON to be autonomous? To be god. To leave something behind that never existed before,"* said Cohen in one of our early email correspondences (2/23/2005). In another email, Cohen made reference to a joke: *"I once made a joke about being the first artist in history to have a posthumous exhibition of new work"* (2/11/2005). In his talk at the Museum of Contemporary Art, San Diego (Cohen, 2007), he explained that this joke was "more a manifesto than anything else. . . . it rested upon the proposition that my computer program, my surrogate self, could continue production indefinitely. . . ." (p. 1).

But toward the end of 2011, Cohen seemed to have changed his mind. The following exchange between Brown (SB) and Cohen (HC) at the Calit2 interview is illuminating:

SB: As you talk about cyborgs—it's a very synergistic relationship. It's very dependent on both parts. Not to be morbid about it, but at a certain point, AARON might be continuing past his biological partner here. . . . So AARON could conceivably go on producing work for the future.

HC: Well, AARON could go on producing work indefinitely. The problem has always been that it would go on being the same work. . . . To be realistic, I rather suspect that AARON will end when I end, because why would anybody want to take up my other half? People should build up their own other selves. (Brown, 2011, p. 39)

Maybe his genie heard him. Shortly after Cohen's passing, AARON stopped working. More

details came from Thomas Machnik, Cohen's assistant:

The last version of AARON Harold developed was the Finger Painting for the 21 Century system. The system required the use of 3 computers. One made the AARON line drawings. Another permitted Harold to work in AARON's space via Touch Screen. And the 3rd controlled the printing of the collaborative works. Of these three only the 3rd one fully functions. Shortly after Harold's passing, we experienced a thunderstorm and we lost power. After power was restored, I was unable to run AARON's line drawing program on computer 1 and unable to run the Finger Painting on computer 2.

We do, however, have a stand-alone version from March 2007 in the studio that can run on Windows XP. I just retested it this morning and it still runs. (personal communication, 1/ 15/ 2018)

Of course there are multiple versions and replicas of AARON in various museums, but the one operating in the capacity of a full-fledged sign, namely as "a development system running in the studio and someone is actively engaged with AARON in the same way or in a similar way [sic] as Harold was" (Thomas Machnik , personal communication, 1/ 15/ 2018) is no more.

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Online Resources

www.aaronshome.com

Author's bio

Louise Sundararajan received her Ph.D. in History of Religions from Harvard University, and her Ed.D. in Counseling Psychology from Boston University. She is a Fellow of the American Psychological Association (APA), and recipient of the Abraham Maslow Award for 2014, from Division 32 (International Society of Humanistic Psychology) of APA. She is associate editor of the *Journal of Theoretical and Philosophical Psychology*, and editor-in-chief of *Palgrave Studies in Indigenous Psychology*. (<https://www.palgrave.com/gp/series/15445?sap-outbound-id=>). She has published extensively on topics related to culture and emotions, and is the author of one book and co-author of another:

Sundararajan, L. (2015). *Understanding emotion in Chinese culture: Thinking through psychology*. New York, NY: Springer SBM.

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Image. The author with Harold Cohen's painting in the background.

Louise Sundararajan is shown here with a painting by and from Harold Cohen who entitled the work "Facing North" when he signed at the back of the painting (although in the catalogue at www.aaronshome.com, this piece is referred to as "Louise's"). Courtesy Louise Sundararajan.

Harold Cohen's last phase of creativity

Harold Cohen's last phase of creativity