

## PREFACE

Joel Chadabe

Peter Beyls is an established interdisciplinary artist who develops computer programs to create music, visual art and mixed presentation formats. His educational background includes studies in both art and science. He is active as an artist, researcher and educator in the realm of digital art. Most importantly, he was among the earliest pioneers to understand that computer programs can be important participants in artistic activities. It was a softly spoken, but immensely important revolution in thought.

From early in history, musical compositions and visual artworks have taken the form of time and space objects. An object is something—material, social, or software—that is separated from the world around it by boundaries. As it developed through the eighteenth and into the twentieth century, the tonal framework for musical compositions produced symmetrical temporal objects, the boundaries for which were defined from start to finish by the tonic chord. By the middle of the twentieth century, in a follow-up to the discoveries of quantum mechanics in the sciences, there was a significant new idea in the air, which was that of underlying complexity. That idea was expressed in music by serialism, randomness, stochastics, and systems. Pierre Boulez, for example, in *Le marteau sans maître*, created an example of the underlying complexity of serialism. John Cage's *Williams Mix* exemplified the underlying complexity of randomness. Iannis Xenakis, in *Metastaseis*, exemplified a stochastic approach. And Elliott Carter, in the *Second String Quartet*, which was based on interactions between the different characters portrayed by the players, composed in effect a system, that is, an entity that functions as it does because of the interactions between its parts. Yet none of these new ideas were expressed as dynamic realizations of the complexity upon which they were based. They were realized as objects, written out, unfolding as a structure in their scores, or in Cage's case, as a tape piece.

That music was structured as objects through the eighteenth and into the twentieth century is one aspect of the music of that time. Other aspects, equally importantly, show that music reflected a representation of human 'naturalism.' First, in a representation of physical naturalism, music was composed in the rhythms to which we walk and dance; its phrases were the melodies we sang, and as its harmonic complexity pushed melodies higher and louder, so they reflected our voices, propelled higher and louder by our emotions. Second, music reflected a representation of the way we understood things happening in the world. One chord led to the next with expectation, as in life, where one event led to the next. In short, from the eighteenth into the twentieth century, the music of the tonal period told stories. Compositions had beginnings and endings; they were about what people did and how people saw things happening in the world.

The period of tonality in music was also the period of perspective in the visual arts. The "stories" of the music were also told in imagery in painting. Paintings too were objects with boundaries, in this case defined by frames. The images were also representational of what human beings saw with the naked eye. Perspective, as a way of organizing items in a painting, led the subjects in a canvas, one after the other, to the horizon. And like music, the visual arts also went through significant changes in the course of the twentieth century.

In the 1970s, Peter Beyls was among a group of musicians and artists that introduced a new framework for music and art in the form of an algorithm that, in an instant, without a score, without a structure, and simply stating the rules of a dynamic process, determined the way the composition would spin out in its long line of time. As a composer, I was involved through the 1970s with a programmable analog synthesizer, built by Robert Moog, called the CEMS (Coordinated Electronic Music Studio) System; and later with a custom version of the Synclavier. Other people were also involved during the 1970s. Salvatore Martirano built the SalMar Construction at the University of Illinois. Herbert Brun and Lejaren Hiller were designing algorithmic approaches to music—also at the University of Illinois—while Gottfried-Michael Koenig was working at the Institute of Sonology at Utrecht.

Peter Beyls began a career of experiments and software developments. His approach was unique. For one thing, he was interested in programs that emulated human activity and that could, consequently, interact with humans as if they were other humans. One of his experiments in the mid-1980s was *Oscar*, a software-driven person, or as Beyls described it, “an experiment in cognitive modeling, in as much as it aims to create an intelligent partner in live performance.”

In fact, Beyls was more interested in the functioning of the software, and how it related to the human being that created it, than in the medium in which it was represented. For him, live performance related to visual art as well as music, and his computer-driven designs through the 1970s and 1980s reflect experimentation. His interest in software was an interest in extending his human effort, in expanding the rules of the game to ideas that he might not have thought of himself. His interest in programs was not in musical robotics. It was in extended creativity.

In an article titled “Creativity and computation,” he writes: “It is stated that the computer provides potential for fundamental novel ways to create new images and transform existing ones. These claims definitely sketch a wrong perspective... In sharp contrast, the machine should be seen as a liberation of the mind, not the medium.” Many of us shared his thoughts. While there were at the time many composers that used computers as tools to exert complete control over a composition, Beyls saw software as an exploratory vehicle that operated in parallel with his intuition. In other words, he wrote a program that included some unpredictable elements with which he interacted in order to compose his music.

As I explain the issue of interactivity in composition, I am directing a group of human assistants. I give them their assignments and then I go away while they work. When I come back to the studio and hear what they’ve done, I correct them, and then go away again, and then come back and correct them again, and go away and come back... and so on as the composition grows. That process becomes interactive when I do it in real time with electronics. In other words, I put together a program that includes different virtual “workers.” The workers may be random number generators, or real-time analyses of someone’s voice, or some other source of information. I connect them to their tasks and push the button. As the program executes, I “correct” them in real time while they work. I interact with them. And because they come up with unpredictable and creative solutions, real-time composition for me becomes a question of discovery and learning.

Beyls calls it a *personal search* and describes the process of the search as *aesthetic navigation*. As he describes it, he has an idea based on a particular type of human behavior. The idea may be vague and ambiguous at first, but it takes a more defined shape as he formalizes the idea in a computer program. As the program begins to function it suggests other aspects of the idea and hints at future actions. Up to this point, Beyls’ creation of software is very normal. The program is the basis of a composition, and he tests it as he writes it and changes what needs to be changed.

But his further concept of software becomes unique. To quote Beyls’ own words, from *Simple Thoughts*, “Being exposed to the consequences of one’s actions (in software) raises inevitable questions of identity: what is the nature of my conceptual universe (personal search space), is there a way to probe it by software?” And he continues: “I prefer to envision my personal search space as a floating network, a loosely coupled web of ideas, impressions and motivations—everything that constitutes my psychology as a living organism.”

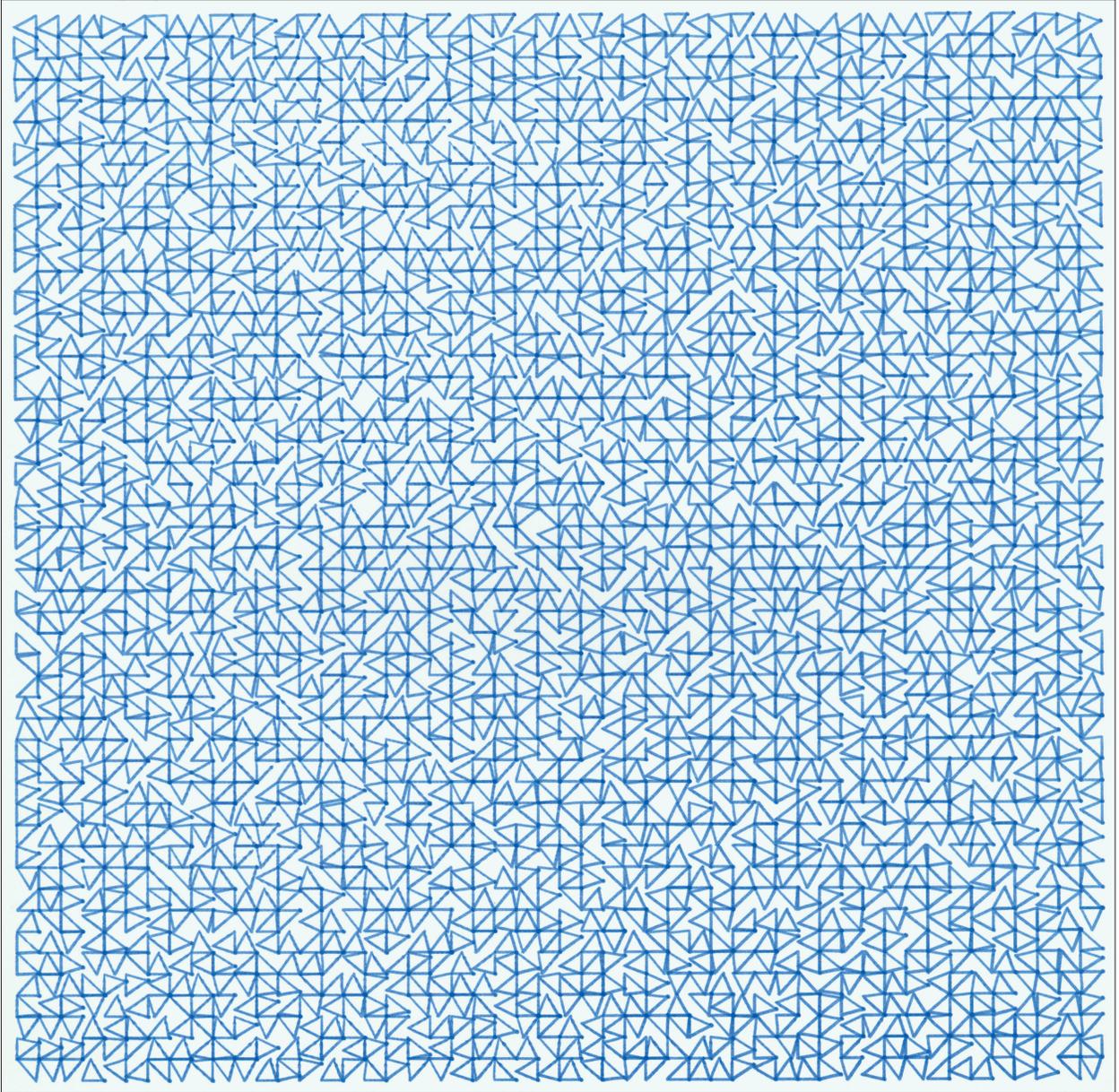
Beyls goes further in his sense of value focused in introspective self-knowledge. He writes: “The ecosystem comprising the programmer and the program holds potential to uncover the true identity of the programmer—identity in terms of his position in the broad framework of human culture.”

More on that ecosystem: “Note that certain aspects of human creativity might be conceptualized as psychological processes, develop into particular algorithms and further materialize, for instance, in a family of machine drawings... Such a prospect advocates a wonderful vision for a programmer; it suggests the existence of creative forces that are just waiting to be discovered without having to probe for them explicitly—then, the human programmer simply engages in creative exploration of readily accessible life-forms free of any preoccupation or prejudice... as it happens, man and machine are mutually adaptive in a social climate of relative independence yet equally close partners in the creative process.”

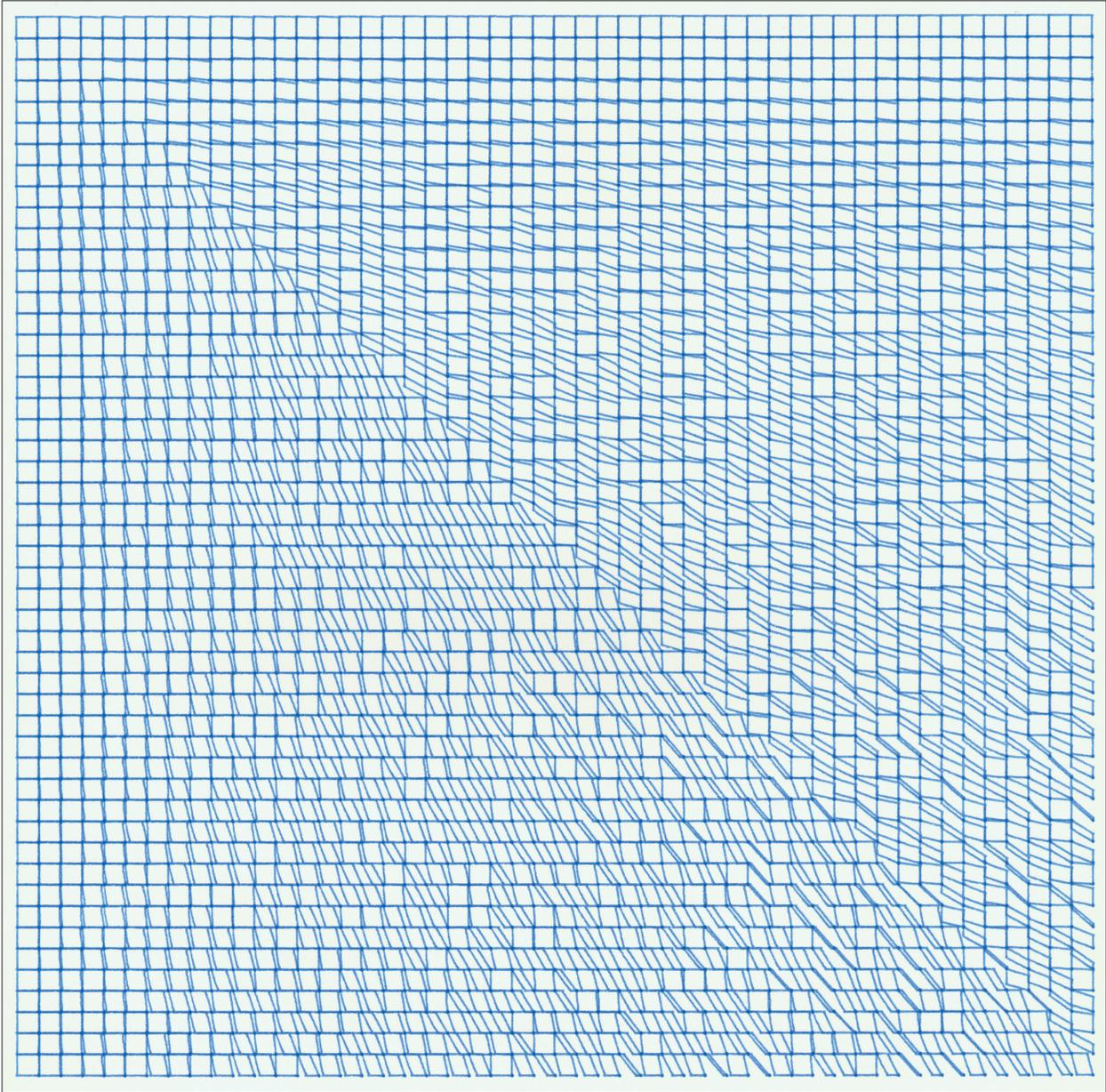
For Beyls, software is the guiding light. He had begun with software as a means of introspection, using human-machine interaction as a platform to explore ideas and identify himself by seeing the consequence of his programming in real time. For most of us who use interactive software processes to generate musical compositions or visual artworks, we gain in finding details that we may not have thought of when we started. For us as well as for Beyls, it is an opening up to the discovery of new possibilities. But as Beyls points out, the software is scalable. His software can go further to probe his conceptual universe. It can also go further, looking outward, toward software-mediated performance systems within a global community. And that is a beautiful idea.

“A true traveller has no fixed plan  
and is not intent on arriving”

Lao Tzu, 600 BC.



[006a] Peter Beyls, *RPX*, 1974–1975, drawing, ink on paper, 360 mm x 270 mm



[006b] Peter Beyls, *RPX*, 1974-1975, drawing, ink on paper, 360 mm x 270 mm