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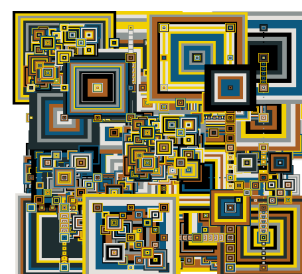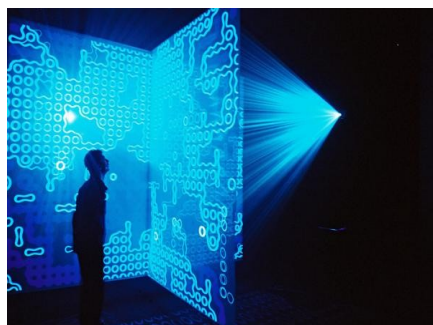(3) Base, S., Art or technology? Dynamic Painting and Generative Art (URL consulted Feb. 2009)
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COMPUTER GENERATIVE ART: PAINTING EXPERIENCE

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With the emergence of generative art which involves computer technology, art is undergoing an evolutionary process with multiple results as programmed by the artist. These processes run autonomously, or in a self-organizing way, according to instructions and rules as preprogrammed using mathematical algorithms to automatically or semi-automatically generate expressions in more conventional artistic forms. Such artistic experiences have been expressed through generative paintings or dynamic paintings as San Base calls it, involving motion introduced into static paintings using the computer screen as canvas. This paper however examines generative art, its history and autonomy, the effectiveness of generative art and the answer to the question on who creates the artwork when the computer is involved. Finally, generative software and the motivation for its creativity are examined.

1.Eden by John McComack 2007 installation video
2.Woman Portrait by Celestino Soddu 1996
3.Marius Watz: System_C, 2004
4.Exploration of Related Points Along a Space Filling Curve #2 11/2/2007 by Don Relyea

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ABSTRACT

With the emergence of generative art which involves computer technology, art is undergoing an evolutionary process with multiple results as programmed by the artist. These processes run autonomously, or in a self-organizing way, according to instructions and rules as preprogrammed using mathematical algorithms to automatically or semi-automatically generate expressions in more conventional artistic forms. Such artistic experiences have been expressed through generative paintings or dynamic paintings as San Base calls it, involving motion introduced into static paintings using the computer screen as canvas. This paper however examines generative art, its history and autonomy, the effectiveness of generative art and the answer to the question on who creates the artwork when the computer is involved. Finally, generative software and the motivation for its creativity are examined.

INTRODUCTION

There are of course different methods for art creation. Traditionally, the artist is the genius responsible for creating a work of art. The skills and motivation of the artist are decisive for the resulting art. However, some artists have experimented with this decisive role of the artist. Visual art also uses (semi-)randomness. For example the action painting of Jackson Pollock has the effect of basing the location where paint particles land on the canvas to semi randomness (the different directional forces working on the individual particle and the laws of gravity). This contrasts the traditional painter who carefully places his brush on a specific point on the canvas. As a result, chance art is often more abstract and less realistic. With the rise of the computer, the number possibilities to use chance and randomness exploded, and with the computer working more and more autonomous and without being controlled by a human artist, the term generative art was adopted. Of course it is still the human artist who supplies the computer with the algorithms that are used to generate art. Generative art can not only be music or static visual art (paintings), but also movies, poetry, 3d worlds and games, or complete (virtual) experiences.

WHAT IS GENERATIVE ART?

Computers have invaded and expanded nearly every art form. From digital creation, recording, manipulation and distribution of music, to animation and film editing; from word processing to the instantaneous cueing of hundreds of complex lighting and scenery changes computer tools are there helping artists to make art.

It refers to any art practice where the artist uses a system, such as a set of natural language rules, a computer program, mathematics, a machine, or other procedural invention, which sets into motion with some degree of autonomy and self organization, contributing to or resulting in a work of art. The most common forms of generative art are graphics that visually represent complex processes, music, or language-based compositions like poetry. Other applications include architectural

design, models for understanding sciences such as evolution, and artificial intelligence systems. Some authors call it computer generated art, computer generated software art, dynamic painting, algorithm art, or just simply generative art. The term generative art does not describe any art-movement or ideology. It's a method of making art. The term refers to how the art is made, and does not take into account why it was made or what the content of the artwork is. (Wikipedia)

Some generative art operates completely autonomously, while some generative artworks also incorporate inputs from a user, or from the environment. The work is usually automated by the use of a machine or computer, or by using mathematic or pragmatic instructions to define the rules by which such artworks are executed (Zanni 2008). System usage is identified initially as a key element in generative art. This leads to the adoption of complexity, order and disorder as efficacious organizing principles in the comparison of several generative systems of art. The trace of definition of generative art is the preference the artist establishes in a system that can generate a number of possible forms, and better than a single terminated form. The artist's role is to build, begin or merely select the frame of procedures to generate possible expressions and, for this, the visual aspect may or may not be determining.
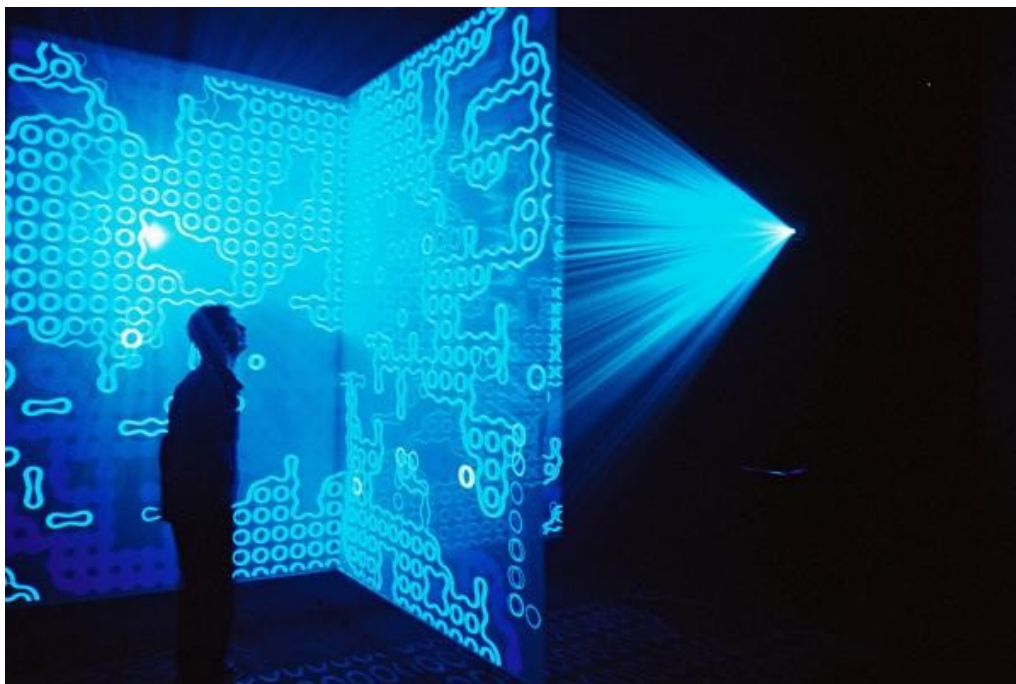

Plate 1. Eden by John McComack 2007 installation video

Also in defining generative art, John McCormack adds the influence of biology and emergent behaviour and in particular the terms 'genotype' and 'phenotype'. He argues that software can be seen in terms of' genotypes' (DNA in cells) as machine code and 'phenotypes' (the higher level form of behaviour) as what happens when it runs. The programmer would set the parameters that defined the fitness, and the software would evolve 'autonomously'. Put simply, McCormack generalizes that the authoring process is directed towards a genotype as the specification of a process, and when this process is executed it generates the phenotype as the 'experience of the artwork' (in Brown 2003). It is worth noting the elevated position of the artist in this description as responsible for the DNA of the artwork in the perpetuation of a

'creationist' myth. Clearly other external factors are at work in creative production in art and life.

EVOLUTIONARY NATURE OF GENERATIVE ART.

In generative art multiple results can be produced by using some kind of generating system. Generative" simply directs attention to a subset of art, a subset where potentially multiple results can be produced by using some kind of generating system. Ward (2005) defines Generative Art as a "form of geometrical abstraction in which a basic element is made to ' generate' other forms by rotation, etc. of the initial form in such a way as to give rise to an intricate design as the new forms touch each other, overlap, recede or advance with complicated variations."

Jalbert (2008) while examining generative art and the specific function sees the intent of generative art as that which gives awareness to evolution. He defines generative art as art where the main technique of development within a piece or series of pieces is an evolutionary process, like biological or physical evolution, or the evolution of ideas. Generative art forms are new and they generate or go through an evolutionary process. This might mean that the intent of the work is to make evolution the primary message. Evolution involves a complex process of development with many possible influences. Much of art involves generative processes of development, selection of work for various reasons. These reasons include everything from emotional impact, to beauty, to commercial appeal, to personal fulfillment, to social propaganda, and more.

GENERATIVE ART IN HISTORY

Generative art had been in history and in other art forms like architecture, music or poetry. In music, Riedel and Ihmels (2004) generative art was utilized in classical music. Wolfgang Amadeus Mozart developed a "musical game of dice" that contained most of the elements that today are associated with generative tools.The piece carries the explanatory title "Composing waltzes with two dices without knowing music or understanding anything about .composing". In aleatoric music, from the Latin "aleator" (the dice player), the principles of chance enter into the composition process. At the same time, it is interesting to observe that this way of working appears not only in connection with a certain genre, but has in fact established itself in nearly every area of artistic practice as music, literature and fine arts.

Marius Watz agrees with Philip Galanter view that works with generative qualities can be found throughout art history and these he describes as computer-based works created from the 1960s till date. He considers much of the work in abstract painting and sculpture done in the 1960s as essential for the understanding of generative art. For the term generative art to have any meaning when applied to a given work, the aspect of generativity must be dominant in the work. Many computer-based art projects have generative elements, but are not concerned with generative systems as an end result. In these days generative art is typically connected with software-based abstractions. (Watz 2007).

Historically, artists working with generative art in the 1960's and 1970's were typically professional artists, working within the art world. The movement from the mid-1990's was dominated by autodidacts, coming from fields outside of art (design and music

in particular) or taking up code by accident. Supported by a strong electronic music scene and an emerging VJ culture, many artists found a home outside the mainstream art world and hence felt closer to the pop culture. The 1990's also saw a rise of the designer as author, with free experimentation becoming popular. With the emergence of tools like Flash and Director and new media like the web, such experimentation was the only way to find the boundaries of what was possible.

Celestino Soddu describes his last projects of generative art in the Woman Portrait Generator. WPG is able to generate an endless sequence of 3D models of a woman's portraits; each one is different but belongs to the same idea. An example of this is Woman Portrait in Plate 2. "As Picasso has repainted Velasquez and has referred to the African sculptures, so I tried to repaint Picasso with a generative art project able to generate a sequence of woman's portraits each one different and unpredictable, but recognizable as Picasso and, also, as belonging to my interpretation of these portraits" (Soddu 2000). Unfortunately African artists have not explored this new medium in the 21st century perhaps owing to latest advancement in computer programming language and illiteracy in computer art. This paper however seeks to inform and motivate artists to venture into this field of arts.

Plate 2: Woman Portrait by Celestino Soddu 1996

http://www.generativeart.com

GENERATIVE ART OF PAINTING

Painting is the "oldest and one of the most versatile forms of two-dimensional expression". There are as many different styles of paintings as there are painters. Some of the painting media used most often are oil, watercolour, tempera, gouache, fresco, enamel, and acrylic. More recently artists are exploring new media in digitization and photonics for various innovative concepts. It is important to note that the artist can use various tools that depict colour to meet his aesthetic needs. Usually, the painter uses paint of possibly different colors and distribute it on a canvas using a brush. The painting process is a process over time in which parts of the canvas get colored with paint one by one. The skill and motivation of the painter determines the color of the paint and the placement of paint on the canvas. The painter moves the brush to create shapes on the canvas, and the shape of the brush has influence on the shape of the paint on the canvas. (Olthof 2009).

Painting is static using paints on canvas and other tools and media. .However, with the emergence of generative art which involves computer technology, motion is introduced into these static paintings using the computer screen as canvas. . As art involves rhythm and movement, it is imperative to say that generative art follows such principle, not being bound by time or space but generating itself into a realistic paradigm and a shift into the future. This is the case of screen savers, visualizations of Windows Media Player. In the case of the of the visualizations of Windows Media Player, some of the works take abstract forms of painting. Often the quality of the images in modern games can compare well with many works of painter-realists.

Commenting on Generative art on Painting, San Base calls it Dynamic Painting.

""I'd like to highlight another example of a new art trend: the dynamic painting. Unlike 3D images created by many computer artists, my paintings are composed of abstract images in the state of perpetual never repeating transformation. The overall idea of the painting remains unchanged, while the computer introduces continuous variations, resembling an artist at work. The colors and shapes go through the changes and the image slowly flows and transforms. The traditional painting has acquired the dimension of time. This creates an extraordinary show since at any moment in time the painting is different, and catching even a glimpse of it, one becomes completely engrossed in the experience. (Base 2009)

Plate 3: Marius Watz: *System_C*, 2004. http://systemc.unlekker.net/

WHO CREATES THE ART? THE ARTIST OR THE COMPUTER?

The question often arises, who creates the art? The artist or the computer? The computer cannot create anything at its will and it doesn't embody any creativity. It's just a tool that works according to a predefined algorithm. The dynamic painting could have many varying parameters that the computer can change to create new instances of a painting. However it can't create anything on its own.

Art forms like painting and drawing have always stressed intuition combined with skill, so that the work is created as a flow. In that sense, surprise is certainly an element The creative process is usually about an irrational moment of transubstantiation, an amazing moment indeed. What is different is the way that generative systems are chaotic, meaning that the artist does not control them completely. They are created and choreographed by the artist, but once set in motion unforeseen properties emerge.

Clavin (2007) gives a more vivid picture of this as he says,

"People have said to me that if I build a machine that creates music or art, what role do I play in the final product? Who is the artist? The art process that I am involved with is the design and implementation of algorithms. When I was at the International Computer Music Convention in 1993 (Tokyo), a panel of composers declared that algorithmic composition was not a valid form of art because the composer was not in control of the music or sound being generated. They didn't understand what the art process was. The art process was the composer creating the algorithms that created the music or sound. Creatively designing algorithms, even when there is random input that affects the algorithms output, is a very valid art form. To answer the question: Who is the artist when the final product is unpredictable and beyond the

direct control of the artist? My feeling is that the composer or artist who designed the algorithmic system is the composer or artist for all possible outcomes of that system.

Base (2009) speaks on the new direction of painting,

"Looking at a dynamic painting might create the perception that you see purely the fruits of a computer's imagination. The endless variations of colors and shapes make it hard to believe that a person has devised such a complex scheme. Some of the paintings are so good they are worthy to be printed on a canvas and to be displayed in the best galleries throughout the world. On the other hand, it is the unpredictability and dynamics that make dynamic painting so attractive. A unique image teases your imagination and in a few moments it fades only to give a way to other astonishing picture. One can always expect something new and unusual from a dynamic painting. Art critics will be arguing about the art status of the dynamic paintings for years to come. This direction is new and eccentric.

Towards the end of the 1800s, a dramatic shift occurred in the art world. At the cutting edge, slavishly copying subject matter was replaced by increasing abstraction, which during the 1900s led to movements of purely abstract work, entirely free from recognizable elements. The bug of abstraction has now taken hold in the world of illustration, often as self-initiated fine art-oriented projects, but increasingly as paid commissions. Technology has its part to play, with the tools required for truly generative, organic art now in the hands of the typical designer. However, people – both creators and audiences – are the driving force" (Grannell, 2009)

HOW EFFECTIVE IS GENERATIVE ART?

For a painting to be effective, Ochigbo (1995) says, it has to employ a good ideal of manipulation of some of the aesthetic principles displayed in good measure. The manipulation of these elements determines the unique reaction of the individual to a unique image."

Is generative art effective? Does it fulfil aesthetic principles? Yes! Generative works of art has aesthetic properties of beauty and idea. Soddu (2000) sees Art as a creative process through a scientific approach. With Generative Art we can approach, directly, the complex paradigm of proportions and logic. So we can directly design the Beauty, or better our idea of beauty, before the realization of each single possible artificial event. This is the heart of the generative approach. Generative Art works for beauty, in the sense of the humanistic approach of the Renaissance, because the generative code is the real structure of the idea. It defines how to bring together all the parts and the dynamic relationship among these parts in the evolution of complexity. The generative project defines what the law of proportion is and which logic the dynamic evolution will follow. All the events that this code can generate will be, in a humanistic sense, beautiful, or, if we prefer, will belong and represent our Idea of the world.

Began Soban, a generative artist describes his art as entirely computer generated and based exclusively on aesthetic ability of mathematics. His works are results of the autonomous process supported by computer programs he developed using Visual Basic. "The algorithms are my creative challenge and the emerging images my artist's emotion. This is my way of doing generative art" Soban (2002). Although skeptics may contest the right of cyber arts (digital arts) to aesthetic legitimacy, it does not diminish its right to originality. It has become necessary to investigate the role of art education in the digital divides, as a matter of fact cyber arts derives its very artistic legitimacy from humanistic significance irrespective of its scientific tools.

Marius Watz examines the reasons why artists may be attracted to generative work. Some want to explore scientific issues in an artistic context, some are looking to create solutions not possible in traditional animation or interaction design, others are interested purely in form and structure. "I know several artists (including myself) who would say that code is the only way they can express their aesthetic ideas. The computer is the great democratizer, as it removes the need for manual skill. I also think the recent trend of generative visual performance systems is important, since it points to an effort to create visual instruments that have the same potential for expression as their musical counterparts." (Watz 2005).

Also Galanter (2003) opined that generative artists could explore form as something other than arbitrary social convention. Using complex systems artists could create form that emerges as the result of naturally occurring processes beyond the influence of culture and man. Generative artists could demonstrate by by compelling examples reasons to maintain faith in the ability to understand the world. The generative artist may remind us that the universe itself is a generative system. And through generative art we regain our sense of place and participation in that universe.

THE AUTONOMY OF GENERATIVE ART

Much of the work in the field of generative art stresses issues of unpredictability and autonomy rather differently. In seeking to clarify what constitutes generative art, Philip Galanter's definition is much cited and positions generative art as broadly rule-based:' Generative Art refers to any art practice where the artist uses a system, such as a set of natural language rules, a computer program, a machine, or other procedural invention, which is set into motion with some degree of autonomy contributing to or resulting in a completed work of art.' (Galanter 2003)

According to Wikipedia.com, to meet the definition of generative art, an artwork must be self-contained and operate with some degree of autonomy. Generative art is a system oriented art practice where the common denominator is the use of systems as a production method. An artist or creator will usually set down certain ground-rules or formulae and/or templates materials, and will then set a random or semi-random process to work on those elements. The results will remain somewhat within set limits, but may also be subject to subtle or even startling mutations. The idea of putting the art making process in the place of a pre-generated artwork is a key feature in generative art, highlighting the process-orientation as an essential characteristic. Generative artists such as Hans Haacke have explored processes of physical and biological systems in artistic context.

Generative art can also evolve in real-time, by applying feedback and generative processes to its own created states. A generative work of art would in this case never be seen to play in the same way twice. Different types of graphical programming environments (e.g. Max/Msp, Pure Data or vvvv) are used in real-time for generative audiovisual artistic expressions for instance in the Demoscene and in VJ-culture. Artificial intelligence and automated behavior have introduced new ways of seeing generative art. The term behavior is particularly useful when describing generative qualities in art because of the associations to biology and evolution, for example with the virus models used by the digital artist Joseph Nechvatal. Autopoiesis by Ken Rinaldo includes fifteen musical and robotic sculptures that interact with the public and modify their behaviors based on both the presence of the participants and each other.

Automating the processes exactly that an artist does while creating a piece of artwork is nearly an impossible task, says Don Rylea. Artists typically are inspired by a variety of things and their creativity generally follows intuition more than a set process. Differences in how artists perceive their subject matter and the choices they make while rendering their works create endless controlled variations in output. The best we can hope to do with a computer emulated artist, process is going to be an approximation of a set of potential artist creative paths that lead to a graphic result.

GENERATIVE SOFTWARE

Software refers to a computer program and the resources related to it that acts upon the hardware of the physical machine components and machine. In more detail, this means software includes not only the instructions written in a particular language as the program, but also the other materials required for it to run, that are usually combined for distribution. Hardware is worked upon, and software performs the work. This link to performance also clarifies something about the use of the term 'software art', in describing not merely software used to produce art, but the software itself as the artwork. In other words, the programmers put the pre-existing hardware to work, in a similar way to artists producing concepts and manipulating materials in more traditional forms.

Roncoroni (2007) says, "True emergence, in digital generative art, can be obtained opening the parameters of the processes: it is the user or the programmer who, manipulating data and variables, actually brings the emergent qualities that algorithms don't possess by themselves. The true value of generative art does not consist in the infinite variety of forms or sounds that is possible to generate, but in the design of the process itself, that is software, which goal is to let its users take advantage of its ideas to enhance their creativity".

Software as material is always liquid, potentially intelligent, interactive and constantly changing. The only way to approach such a medium is as a sum of processes and interactions. Generative art and design describes a process-based practice, where the artist enters into collaboration with the machine, describing aesthetic qualities in terms of rules and instructions. Random factors are allowed for in order to produce organic behavior. By combining rational/scientific principles with subjective/aesthetic choices, new and unexpected products are created. The results are dynamic forms and processes through which we gain a new understanding of the world around us, as well as a new and dazzling source of aesthetic experience.

New ways to approach the reality also mean new ways to understand the use of the tools. Tools are not neutral; each software imposes limits and rules to the user that determines the result. Functionalities that can be observed in different design software have been implemented by software designers and programmers to satisfy needs and standardized uses. But computers are not just a new tool, it's a new medium, it generates new possibilities.

Following Cox (2007) observation, creative endeavour is seen to be programmable, and is considered in terms of its execution. The use of executable formal instructions makes explicit the idea of software as potential literature (or art), whether running on a computer or not. Indeed all conventions of writing and reading, of both text and code, have in common that they are part of a set of abstract (coded) systems of input and output.

Roncoroni (2007) sees it differently when he said that the appeal of generative art begins in the emergent and dynamic quality of complex systems. Many digital artists argue that the self organization and the chaotic indeterminism that belongs to natural complexity can be digitally simulated and reproduced using techniques such as Cellular Automatas or L-Systems. His generative program of which he designed, GDesign is a 2D/3D free generative art application for Windows. With GDesign one can interactively build, test, and edit complex models using DOL, Stochastic and Parametric LSystems, mixed up with some Cellular Automata techniques. The artist creates, edit, build and preview huge 2D and 3D objects with extended LSystems and Artificial Life tools and also builds organic forms, architecture models. It has generative 3D image processing filters and it is good for architecture, design, art and art education. With this application, one can use special symbols, macro, functions and Subsystems to edit and control very complex objects, link interactively 3D objects to symbols, and use Ovary and 3DMax prebuilt scripts. Also it is easy to change or set parameters and parts of the system in real time, and to use automatic behaviors and bitmaps to apply special effects to systems.

Other generative software includes:

The Java-based *Processing* which is probably the most used platform for Generative Art. It is an "open source programming language and integrated development environment (IDE) built for the electronic arts and visual design communities".

Nodebox – A Python based alternative to Processing. The new version 2.0 is finally available on Windows.

vvvv is "a toolkit for real time video synthesis". Not only video – vvvv also handles audio and static images quite well.

PureData a "real-time graphical dataflow programming environment for audio, video, and graphical processing."

SourceBinder is a node based visual development environment for Flash 10.

Plate 4: *Exploration of Related Points Along a Space Filling Curve* #2 11/2/2007 by Don Relyea

Don Relyea also wrote his custom software application *Space Filling Curve Art Generator* to create generative art and video. One of his generative works is the "*Exploration of Related Points along a Space Filling Curve*" in Plate 4. The application was created in Adobe Director and C++ to render the image. The main program algorithm is based on the Hilbert space filling curve, discovered by mathematician David Hilbert in the early 1900's. The program recursively draws rectangles along the curve, storing special points in a lookup table. At certain times during the execution it draws larger concentric rectangles and connects the stored special points with trailed concentric rectangles. The program accesses a color theory algorithm that manages the colors used during program execution. It can output very large detailed high resolution images.

Included is the main source code below so one can see the code manifestation of the mathematics behind this work.

```
on hilbert_draw(x0, y0, xis, xjs, yis, yjs, n)
--/* n=number of recursions*/
--/* numsteps= number of drawing iterations between two points on the curve*/
--/* x0 and y0 are coordinates of bottom left corner */
--/* xis & xjs are the i & j components of unit x vector */
--/* similarly yis and yjs */
repeat while n > 0
hilbert_draw(x0, y0, yis/2, yjs/2, xis/2, xjs/2, n-1)

draw_from_to_numsteps( point(x0+xis/2, y0+xjs/2), point(x0+(xis+yis)/2, y0+(xjs+yjs)/2),
numsteps)
hilbert_draw(x0+xis/2, y0+xjs/2 ,xis/2, xjs/2, yis/2, yjs/2, n-1)
draw_from_to_numsteps( point(x0+xis/2, y0+xjs/2), point(x0+(xis+yis)/2, y0+(xjs+yjs)/2),
```

```
numsteps)
hilbert_draw(x0+xis/2+yis/2, y0+(xjs/2)+(yjs/2), xis/2, xjs/2, yis/2, yjs/2,n-1)
draw_from_to_numsteps( point(x0+(xis/2)+(yis/2), y0+(xjs/2)+(yjs/2)), point(x0+(xis+yis)/2,
y0+(xjs+yjs)/2), numsteps)
hilbert_draw(x0+(xis/2)+yis, y0+(xjs/2)+yjs, -yis/2,-yjs/2, -xis/2, -xjs/2,n-1)
draw_from_to_numsteps( point(x0+xis/2+yis, y0+xjs/2+yjs), point(x0+(xis+yis)/2, y0+
(xjs+yjs)/2), numsteps)
n=n-1
if n=0 then exit repeat
end repeat
end
```

GENERATIVE CREATIVITY

When a programmer develops a generative system, they are clearly engaged in a creative act but what kind of process is being executed? An artist makes creative decisions to produce a final artwork, yet it would be futile if these decisions were the same every time. In this sense, the focus of creating generative art is not trying to achieve a balanced output, but to capture these decisions as logical structures. (Ward 2007). The computer executes these rules but never produces the same result twice. In this sense, the code could be seen to be more like the chaos mathematics used to simulate complex systems than a mathematical formula like pi. Ironically, perhaps this idea of unique execution could be seen to re-establish aura, yet the decisions the code takes to arrive at a final result are of little significance (as in the case of a random number generator, for example). Perhaps the lack of aura is maintained all the same. Invention and innovation is made possible by groups and individuals operating necessarily within social systems and specific discourses. By programming computers to undertake creative instructions, it is possible to argue for more accurate and expansive traces of creativity that suitably merge artistic subjectivity, social context with technical form. For instance, to make a system more intelligent it needs to operate socially, as with a Neural network that needs feedback in order to learn.

Emergent creative practices have sought to examine creativity in the light of scientific investigations in artificial life, simulating the characteristic processes of living things, from the operations of ecosystems and evolution to the encoding of DNA. Eduardo Kac's *Genesis*, commissioned by Ars Electronica 1999 is a striking example of this tendency. The key element of the work is the reproduction of an 'artist's gene', synthetically created by translating a sentence from the book of *Genesis* into Morse Code, and then converting the Morse Code into DNA base pairs according to a conversion principle specially developed for the work.

CONCLUSION

Lately generative art has become more accepted by the art world, being shown in galleries and even sold to collectors. As a result, some artists are moving away from the pop culture and describing their work in high art terms. For many of them, the media art scene with its political and academic bias never felt like home anyway. Generative art should be understandable without any prior knowledge of the process involved. If not, then the artist is either making art for artists, or needs to work on her presentation skills. As for the complaint that generative art is simply decorative, fit only for screensavers or wallpaper patterns, it is hardly worth answering. Such a position would invalidate most of art history

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