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Generative art

With processing and p5js

Ardavan Hemmat Pour

TERM AUGUST – DECEMBER 2016

THE DESIGN SCHOOL

SCHOOL OF BUILDING, ARCHITECTURE

AND DESIGN

TAYLOR'S UNIVERSITY

AUGUST 2016

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Abstract

In this paper an attempt is made to offer a definition of generative art that is constructed from different points of views of other researchers, and put on one ground. First the use of systems is in history is introduced in generative art. Various ideas from Human Expression to Effects on Design and aesthetics are then introduced. Here is noted what the elements that constructs a generative art, both the from the artist's mind and the system itself. It is noted that generative art has been a major influence on the world today as internet and technology has been more and more in use and how that is changing concepts of brands. Also noted, the difference between fine arts and generative arts, and if one is superior to another.

Content

1. Introduction

This research is intended to explore the field of generative art with processing and p5js, and to explore the use and concept of code in creating art in modern day, and what possibilities and potentials it may in field of art and design and our lives. This varies from the effects on modern art, to architecture, or the design market and branding, or even the effects on human expression.

The field of generative art is very recent and modern, and analyzing generative art and the works that has been made using the available tools, the researcher intends to explore the elements such as its aesthetics, the technological and practical elements that constructs it, the use of other mediums, and it's influence on other fields of design and society.

The main purpose of this research, is to participate and be part of the discussion that has been going on in the design community about the role of generative art and all it's elements, and to look at all the different opinions over the years and filter through them and to find common spots between all of them, so at the very least, help with the creation of a common ground. By having that, or even showing the possibility that such ground can existing, it can allow more focus on collaborations and creating new and unique works.

In order to gather the data for this research, the researcher decided that judging by the nature of the topic and the technicality it has, it's best to rely on self observations of other the artists works, and their articles and the available seminars online. The researcher was also able to contact some of the authors in the field of generative art and design a questionnaire for them, this created an opportunity for gain more perspective toward generative art from the veterans in the field.

followed with these explorations, and the knowledge obtained by them, the researcher began finding suitable works that have had an impact and stood out from others, and take the knowledge from previous sections of the research and use them to do an in depth case study of the chosen works.

The vast sea of generative art provided the researcher with great information and a great amount of provocative questions. The influence and the history it has had was greatly surprising and one of the highlight findings has been that with the birth of the computer, it has made designers look at the past and realize how rooted this topic is and now with the knowledge of it's existance, they can create projects while being aware of this knowledge, and use it to a far better advantage.

2.Literature Review

What is generative art?

It can be said that the subject such as generative art gives the idea of new and modern computer generated graphics and artworks, designed by means of programming or other tools. That generative art is a modern form of art created with computers and has not existed before.

More important and the most basic question is, what is generative art?

*"**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**."*

Philip Galanter (Galanter, 2003)

There are three points highlighted by this point, (1) is that generative art only references to the process of making the art and not the why and what it's content is. (2) generative art is not specific to computer generative art or any technology based art, but free in the sense of being in multiple forms of art. (3) Each system that is capable of creating and bringing any forms of art, to the realm of generative art, must be capable of operating on it's own.

This definition (Galanter, 2003) by far is the most accurate definition regarding generative art, in which it also highlights the fact that generative art is not merely computer based art, but also great artists and writers throughout centuries have used it in their own forms.

This section of course might divide the audience as it is set to highlight some of the generative arts created throughout time, and due to the freshness of the topic and people's perception of generative art, the examples might appear confusing to the readers.

Forms of generative art in history

Figure 1
Mozart
Britannica 2015

Wolfgang Amadeus Mozart (Figure 1) is perhaps one of the greatest composers of all time and he was was born in 1756 in Austria, and his works are still being studied and performed. Surprisingly, this great composer created a system that he used to create some his greatest works for example *Musikalisches Wurfelspiel (musical dice game)* (Pearson, 2011) (Welton, 2014).

He would create five or six individual pieces, and he would roll a dice. Depending on how the received numbers, he would arrange and cut and paste the different works together. With a six sided dice the possibilities of combinations will go up to 7,776 and with six rolls it will go up to 46,656.

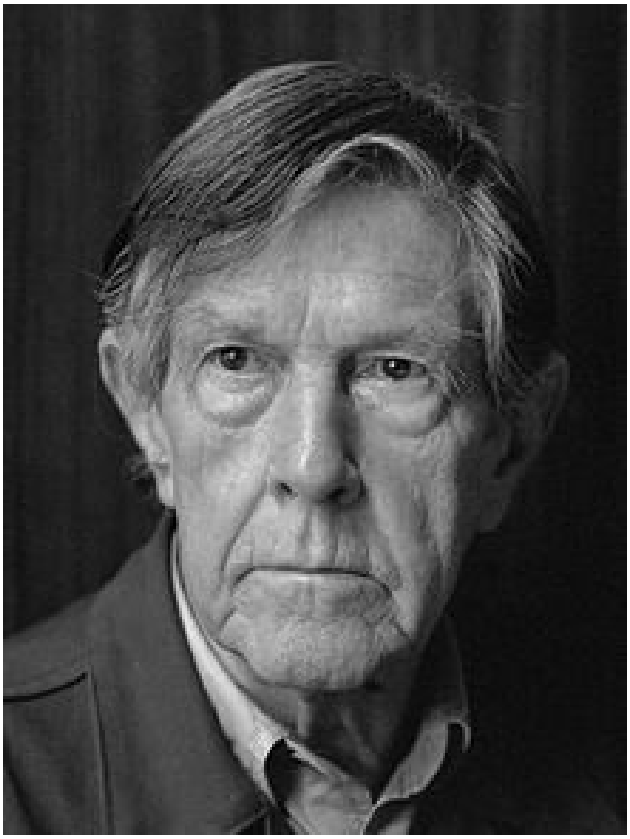

Figure 2 John cage

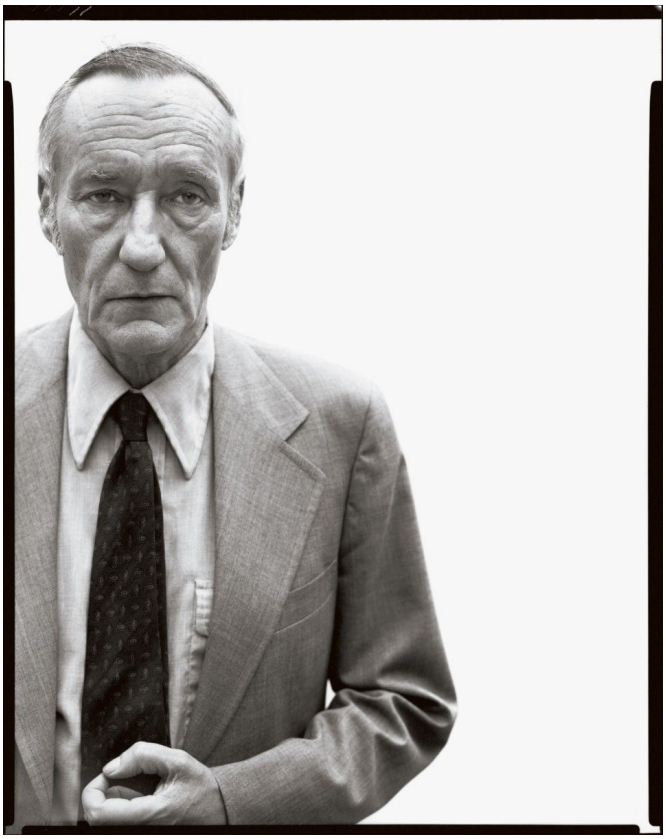

Figure 3 William S. Burroughs

The artists above you see have all used generative art in one form or another John Cage (figure 2) created his famous piece called, 4’33, where the orchestra will not play anything for 4 minutes and 33 seconds and will not make any intentional noise, therefore the only source will be the environment and each time the performance will be different.

William S. Burroughs (figure 3) author of Naked Lunch, wrote 3 novels in early 60’s and cut them up and put them together in a different way, and created the The Nova Trilogy (Welton,2014).

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Generative art and other mediums

Generative art aesthetics

When it comes to the aesthetics of generative art, there is a need for consideration that due to the lack of research, or more accurately the novelty of it, it is hard to pinpoint a solid ground for it. The aesthetics of generative art is deeply twinned with the birth the internet because the discussions and researches really began to escalate with the birth of the internet.

First, in order to explore the meaning of generative art, we need to deconstruct and look at it's very first element, art. The definition of the word, art needs to be explained so the generative art can began to have it's meaning.

What is art ? the answer will come from the realm art theory and philosophy, and best source is from Kant's work *"Critique of Judgment":*

"*When we judge free beauty (according to mere form) then our judgment of taste is pure. Here we presuppose no concept of any purpose for which the manifold is to serve the given object, and hence no concept [as to] what the object is (meant] to represent; our 230 imagination is playing, as it were, while it contemplates the shape, and such a concept would only restrict its freedom.****"***

Critique of Judgment (Kant, 1790)

"*beautiful and sublime agree on a point of pleasing on their own account. Further they agree in not presupposing a judgment of sense or one logically determinate, but one of reflection.****"***

Critique of Judgment (Kant, 1790)

What is evident in his philosophy is this logical fact that is highlighted, which is that the aesthetic value of an artwork is not necessarily determined by the content or it's subject.the viewer's response to the work is the element which makes

the art, regardless of the concept of the work even if it's generating. (Happersett, 2005)

2. Research Methods

For the researcher from the very first step, it was evident that due to the nature and more importantly the novelty of the topic, there should be a basic analysis of what the topic itself is constructed of. Meaning that due to it's novelty and the lack of resources that are really specific toward the topic, the researcher had to look at each block that creates the topic and investigate them individually.

This of course doesn't apply to all researches found as there are ones that are focused on the topic itself. This deconstruction of the topic helped with creating of a more efficient and detailed design of the research, because of resources and researches done on different parts of topic is much more vast and accessible.

The researcher was also aware that due to the practicality of the topic, and also the amount of unsuitable or imperfect research materials, that there must a great reliance on self observation and what the researcher himself can accomplish and understand from subject.

Self observation proved to one of the most efficient ways to approach this research, because it also opened the room for case study of different artists and programmers work. For a topic such as generative art, the biggest resource available is the works of other artist which they constantly upload and share it on the Processing Community for other to see.

This also led to the researcher going through and making a few projects himself, by following the tutorials available online, most notable resources are such as, P5.JS Library, Open Processing Community and MOOC (*massive open online course*) provider websites such as Kadenze.

This gave the researcher the advantage to for a brief period forget about the research and to mainly focus on understanding the process and limits and capabilities of the tools, for the sake of learning them, therefore allowing a far better analysis for the research at hand.

The second method of research chosen by the researcher was doing an interview with the author of the book GENERATIVE ART, Matt Pearson. The reason being for doing an interview is that it allows a far better direction to the researcher because again for of the nature of the topic contains too many elements, and focusing on one experienced individual could produce a far better result.

Must highlight that initially the researcher intended to do a survey among the processing community, but because of the variety of the processing designers and generative artists, it was evident that the results will be way too scattered to be efficient and will only make the work harder, specially the design on the questions that can cover the entire subject and yet still allow the researcher to narrow it down.

When it comes to doing a case study, the advantage the researcher had was doing the deconstruction and self observation prior to it. This is because by doing that, when the case study began, it was far more evident to the researcher for where to look when he is looking at a project, rather than going at it without a clue where to look for.

It was also decided that for doing a case study, that the focus must not be on one project as each work contains only a few of the elements of generative art. Therefore the researcher gathered works from different artists that have the most in common and allows a better analysis and comparison for the works. Having an specific criteria in mind was also key to making the case study much easier, cause without that, any kind of work would have been chosen and the results would have been a case study of a series unrelated that have little to nothing in common.

3. Results and Findings

Self Observation

When it comes to researching and writing about generative art, the researcher sees the need to be aware of not diverging into the vast branches of generative art, thou in order to provide a solid explanation and research, each branch needs to be touched upon at one point or another, with the structure maintaining its direction towards computer generated visuals .

Generative Art is another form of art, and it should be evaluated and compared the same way as other forms of art, only then we are able to build a set of aesthetics for it to be measured by.

Modern computer generated artworks is the modern phase of the arts and the difference here is that instead of paint, it's pixels. This in fact applies to every art in every era, first we had the cave paintings, then we began carving rocks, then we began sculpting and making paint, and forging metals etc ... . each era had it's own forms of expressions, from static forms of art to systems that helps generating them.

The element that creates a work of art, is not just the results of the work, but the process. Process is the element which can indicate if a piece can be called a work of art. The process is what generative art, and in specific, modern computer generated art has mastered in a great sense.

The researcher wishes to indicate that the above statement is by no means trying to imply that the computer generated artworks is a superior form of art, but that it's building blocks are composed of the rawest and essential elements, a work of art can have.

The programs such as processing and p5.js, and of course many other forms of programming languages available, by nature, serve a very particular purpose for

the process, and this not just toward arts, but any other fields involving programming as well.

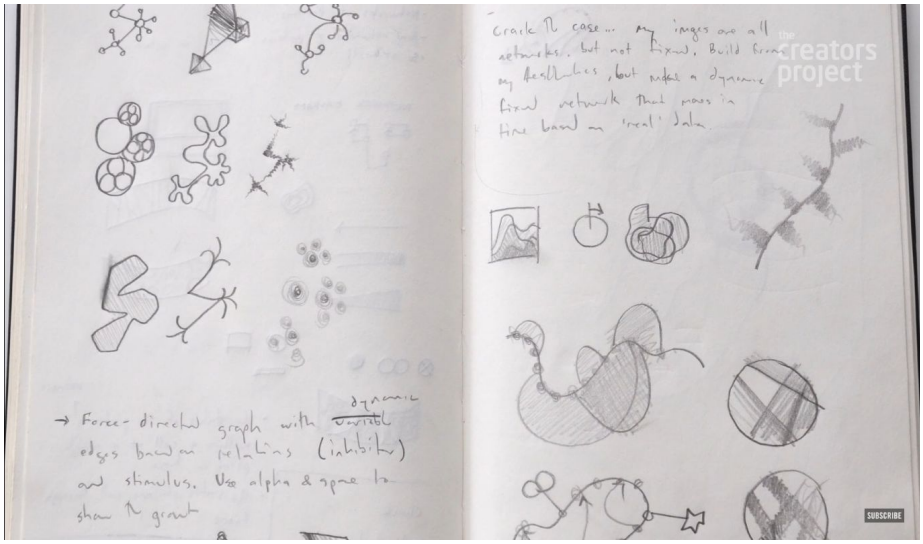
The nature of programming is the process here. The nature of programming is separating the objective, here it can be art or a piece of software or a game, to as many lines of code, needed to created the desired outcome.

Breaking apart every action needed for the desired outcome, creating and outlining the logics in which the systems is going to function by. The nature of code is the process and that establishes the generative art.

"Learning programming teaches you how to think, is like going to the law school."

Steve Jobs

Generative artists follow the exact same process as any other artists in the world, but with more precise calculations because of their constant evaluation of their thought process, out of their mind and on a mirrored screen.



As you see in Figure 4,6,7 the designer, goes to a very similar work process and any other artists, by sketching down the idea, and it's possibilities, and what are the logics of the system in which he intends to put the design into.

Figure 4 Casey Reas, Creators Project 2012

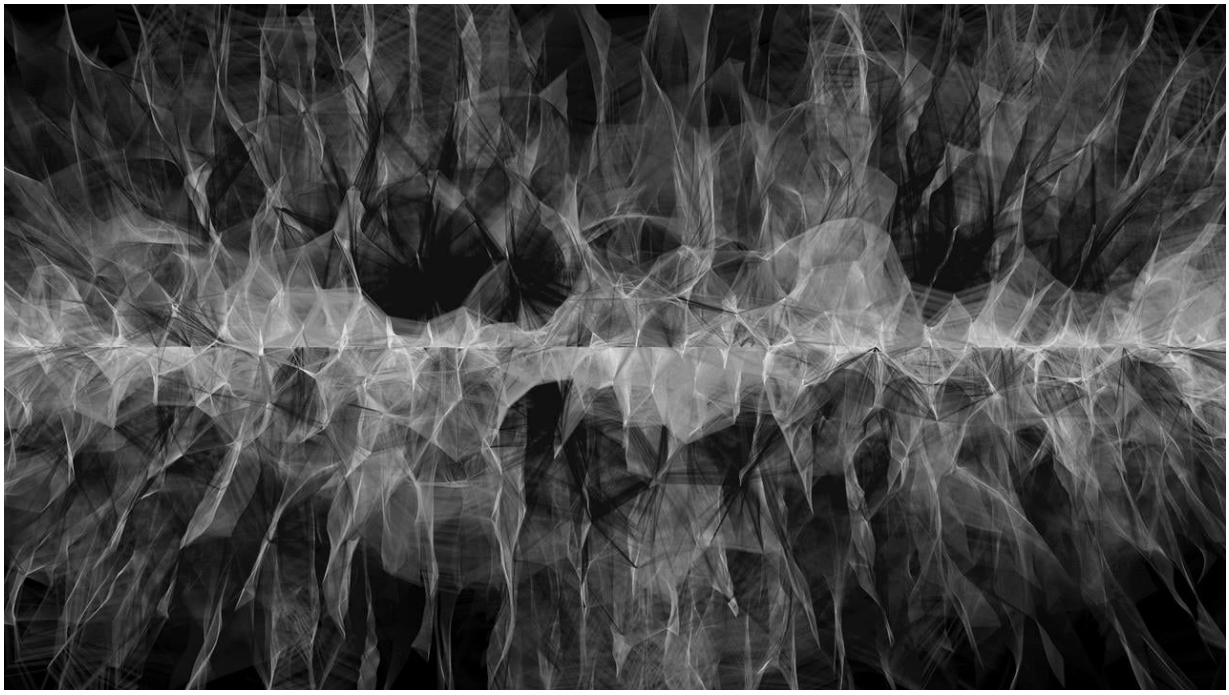


Figure 5 Casey Reas, Process 13

What is shown here in (Figure 5), is the final outcome of what (Figure 4) began to be. One thing that is needed to be mentioned is the artist's expectation of the outcome can always be surprised, based on the fact that the system and the set of logic they created, have created a sort of ecosystem for the artwork to thrive in, therefore the results can at times be unpredictable.

Artist Casey Reas created a set of rules that goes as follows; When each Element moves beyond the surface, move its position back to the origin. Draw a line from the centers of Elements that are touching. Set the value of the shortest possible line to black and the longest to white, with varying grays representing values in between.

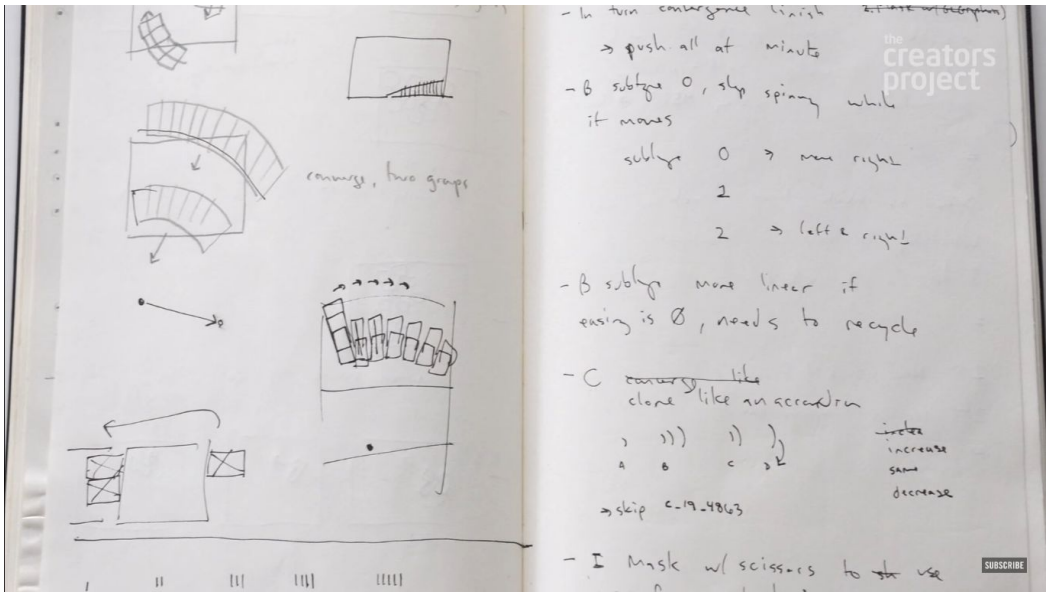


Figure 6 Casey Reas, Creators Project 2012

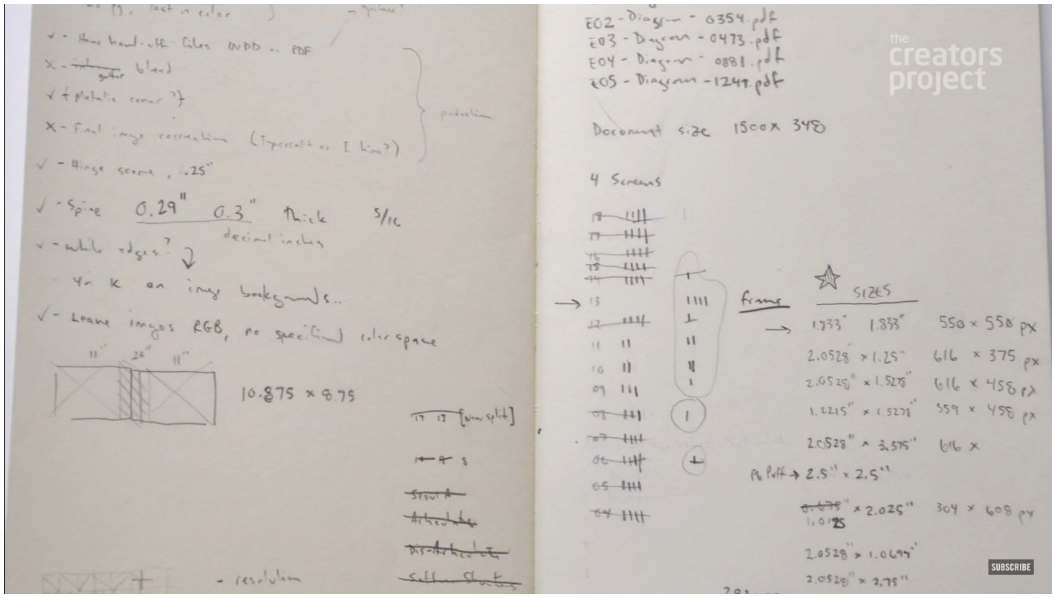


Figure 7 Casey Reas, Creators Project 2012

The design is set in a way like a score composed by a composer, each time that the design runs on a system, the results will be different than before.

Algorithms and other Mediums

As it's been mentioned in the previous section about the process, a fact should be highlighted that with analyzing and breaking down ideas into sets of rules and logic, we are enabled to also analyze and break down things in nature.

Currently what the technology and programming has also enabled us to do, is to be able to analyze patterns in nature and see what can we learn from it and apply it to our lives. That within itself is a very mature phase of generative art.

Algorithms written by programmers and designers helps as the building blocks of code which makes all this possible. In mathematics and computer science, an algorithm is a step-by-step procedure for calculations, they are used for calculation, data processing, and automated reasoning. It is an effective method expressed as a finite list of well-defined instructions for calculating a function.

In order to highlight this topic better, the researcher must point out the works of a dutch designer, *Joris Laarman* head of MX3D. The company that has done great researches regarding natural patterns in nature and how they can be used in everyday design. Natural patterns here means, from how a sea shell is created and what are the sorts of logics it follows, to the pattern a flower uses to grow.

Figure 8 Joris Laarman Bones chair

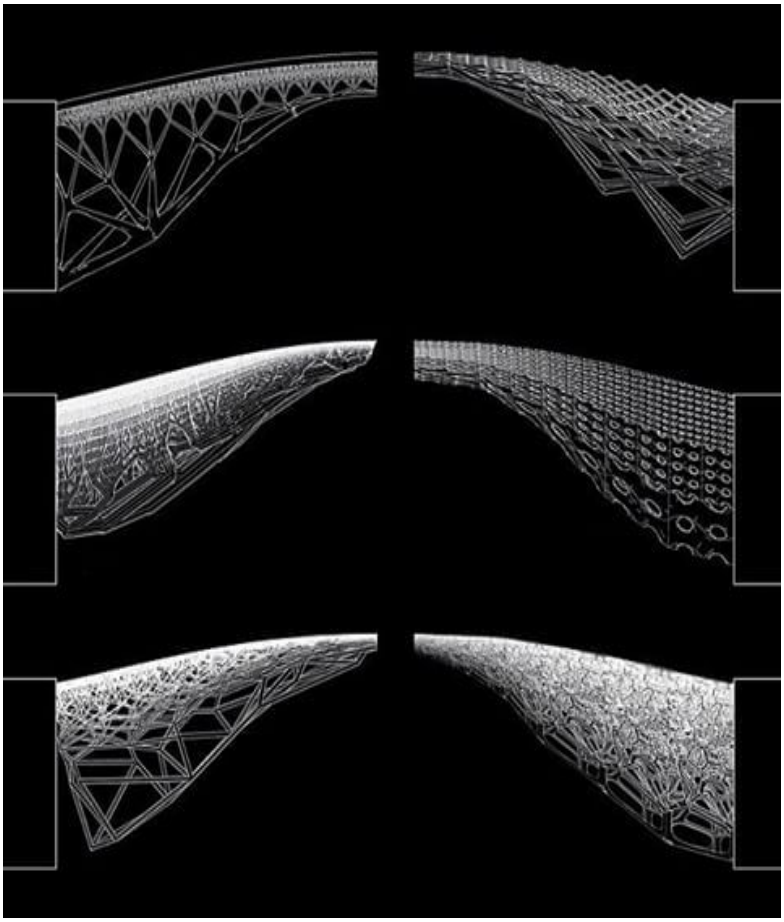


Figure 9 Joris Laarman Bridge

Their breaking down of natural patterns and finding the logics that they based on lead to their new way of design. For example as you see in (Figure 8), which is one of their first and most famous work, by analyzing the logics of trees and bones thanks to the research of Prof. Dr. Claus Mattheck.

Creating an Algorithm and a set of codes in which it mimics the nature, and creates branches that are only created with necessary forms and curves and girth where their existence is necessary .

"It's a way to remove materials in certain areas, without the construction loosing it's strength, that way you need less material while it looks much more organic."

Dutch Profile, Joris Laarman (Laarman, 2013)

These sets of rules and logic creates a sort technological ecosystem where the designer user can feed it's ideas and by the rules that are set, the design can emerge. For example, if the Bones chair (Figure 8) was designed having it's seat, more towards the edge, because the weight will move to the edge, the program that is written, understands that it must put less pillars on the back and more pillars to the front, therefore we will have a whole new design following the same system and concept.

Interview

The researcher decided to conduct an interview with the author of the book Generative Art, *Matt Pearson.* This was a far better method than a general survey as the writer of the book is one of the pioneers of Generative Art and has extensive and reliable knowledge in the field.

The interview was done over emails as Mister Pearson's busy schedule and the time difference between Malaysia and America. The interview highlighted matters from the aesthetics to the process of making an a piece, to the role of coding in art creation and the influence of it in our society.

Aesthetics

The question of aesthetics is one of the new topics of discussion among the designers today and it has proposed some challenges. This is of course because the designers need to know the value of their work and when a topic such as generative art has never been really put to research until recent years, creates the difficulty for both sides of the viewer and the designer themselves.

There is the argument of art not needing to be deconstructed and analyzed, and must only speak to the individuals, but every form of art that was born at anytime have undergone through such analysis by the public and experts, even

cubism or impressionism. They all had the stage to themselves at some point or time to speak introduce themselves to their audience.

The same is happening with generative arts now, but there is the beauty and a challenge to the work, and that is that no two generative artists works, look the same. While the works like cubism, all have a monument and their sets of rules that all cubism artists follow.

Uniqueness of Generative Art and the process of creation

The uniqueness generative art lays in it's building blocks, just as an oil painting can only be good as the quality of the paint used. The uniqueness comes from three elements, one is the the intial idea and the sketch of the final product or process in mind, and the second comes from blocks of code that an artist spends time building according to the work he has in mind. The final element here is the lunch of the work and bringing the rules and algorithms you have designed to life and seeing how the elements respond to the work each time.

Influence

The influence of generative art has always been there in history, on daily basis, from the creation of the works of art to architecture and branding. Generative art highlights the need for constant new content the society, where as soon as one work is made, it's life will be only a few hours and will be forgotten under the vast sea of content. This was not the case in the time of Micheal Angelo or Mozart, because the world is not moving forward in the speed is going today.

That's why being able to create content on daily or even hourly basis is what the modern day corporations want, so they won't drown under the pile of information and content designed by other brands, but to remain above the pile. Generative Art and programming are only one of the tools here that does such for creatives and companies.

Human Expression

Human expression in generative art is highly dependant of the type of generative art in discussion. One aspect here is that, in a single piece of art by an artist, can human expression or the artist's expression be conveyed, when programming is used for such creation and that in nature is far too detailed and thought of (Figure 9) , compared to an abstract work from Jackson Pollock (figure10).

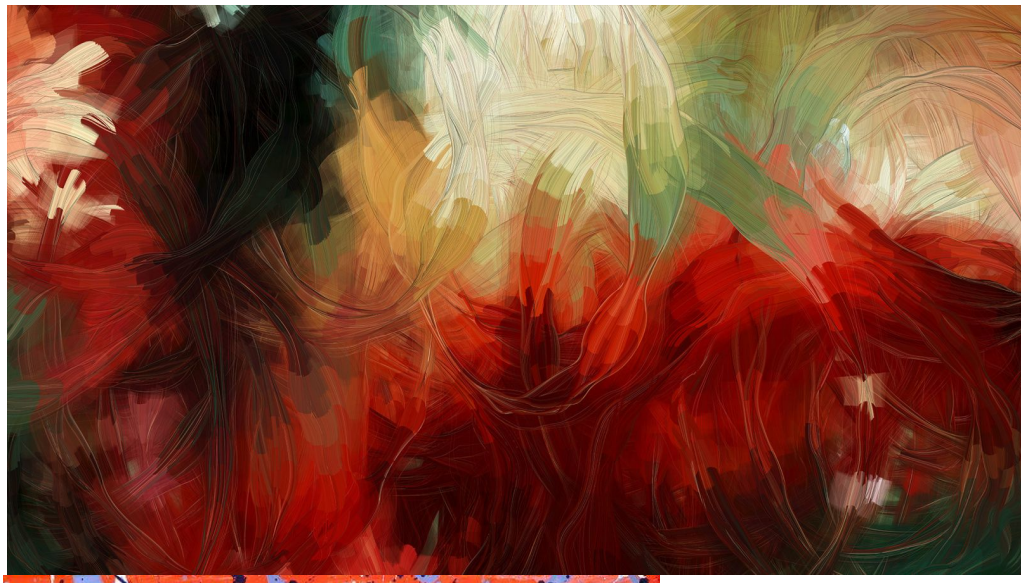


Figure9 Generative art 2

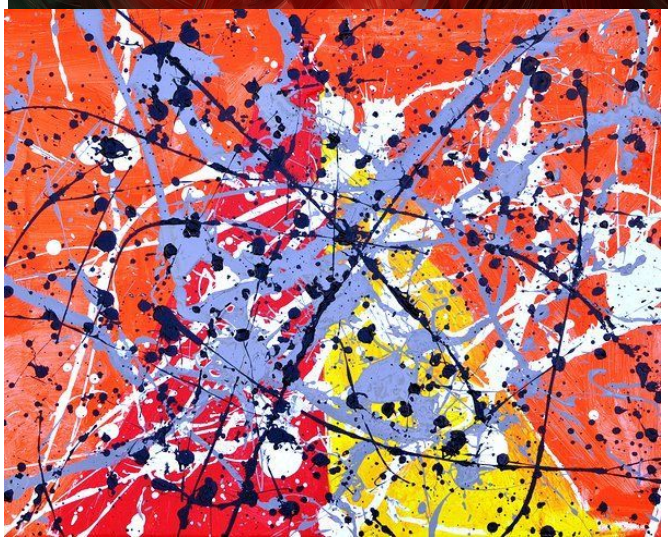


Figure 10 Pollock Splatter

Case Study

For the case study, the researcher first wanted to find one singular project that can highlight all the elements that was needed for the work, but due to the difficulty that it would cause, as mentioned in previous sections, the researcher decided to gather a series of works that have the most in common with each other, to help produce a more accurate analysis.

The researcher looked at the works that are not being made by the artists, for the sake of the artworks, but rather works that are done by brands and companies that have taken a leap into the digital design and generative art, from the traditional side of the design. Their act have highlighted the realm of possibilities that generative art and programming can bring to the table, specially in year 2016 that the use of computers and technology isn't limited to the home or the office but as a part of society's key arteries and everyday use.

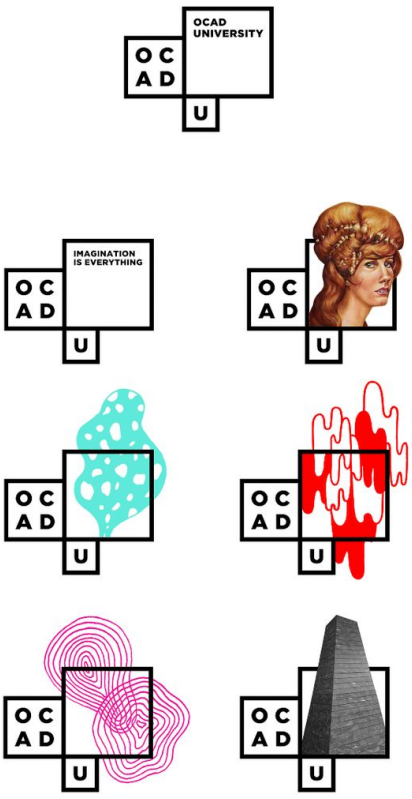


Figure 11 OCADU logo

Figure 12 OCADU logo

The most diverse platform that could cover the essence of generative art, and constantly keeps itself updated with time is the world of branding. The nature of branding has changed because of the rise of social media and people's unquenchable thirst for newer content on daily basis.

Dynamic Branding is an identity that can be changed, but has a basic element that always remains the same. Whether it is the word-mark, text/word itself, colors, or shape; the brand is still recognizable.

This allows companies to connect to everything; the change of logo in relation to the seasons, the change of logo for a special occasion, etc… . The researcher also needs to point out that , an identity that is constantly changing can lose it's credibility, because people don't know what to expect from the brand anymore. It could imply that the feeling the company is not trustworthy.

The researcher came across a research material called (*dynamic identities: how to create a living brand) By Irene van Nes,* that categorized the forms or in more generative art term, rules, in which one can generate a dynamic brand. The rule sets goes as below (Van Nes, 2012):

- Container

The most obvious choice to create a dynamic identity is to approach the logo as a box that can constantly change it's content. Playing with just one variable, such as colour or imagery, can already create great variety while remaining recognisable.

- Wallpaper

Another common example of dynamic identities is placing variables behind a constant logo. The total shape may vary, but the impression is still a single identity.

- DNA

Dynamic identities can also be created by supplying a toolbox containing several core ingredients. Various recipes can be created using these ingredients, resulting in a different outcome each time.

- Formula

Instead of letting the ingredients being the core of the identity, one could also let the system be the constant. Whether it is a grid or a set of rules, it forms a language, a formula, that brings everything together.

- customised

It lets the client interact and be part of the brand. It makes the client the owner of the brand. Customisation is the first step towards letting the identity reflect a certain sense of community, creating an emotional bond.

- Generative

Making a set of rules and creating a system in which the design elements that are going to be used, interact and respond to them and each other, and therefore creating unique works that are different from one another yet carry the same elements. The best example for this case study is the place that laid the foundation of generative art, MIT Media Lab (Figure 12).

Figure 12 MIT Media Lab 2011 Logo Figure 13 MIT Media Lab Logo 2016

MIT created headlines with it's new logo and it's uniqueness and it's possibilities. The design showed something modern and bend the rule of static and singular art direction. There were other brands that did have used such methods but MIT made it well known.

The new visual identity here is: Creative people from different of backgrounds come together, inspire each other and collaboratively develop their vision of the future. Each of the three shapes stands for one individual's contribution to the work and the resulting shape represents the outcome of this process: A constant redefinition of what media and technology means today.

The logo is based on a visual system or as the researcher categorized before, Generative. An algorithm that produces a unique logo for each person, for faculty, staff and students. Each person can claim and own an individual shape and can use it on their business card a personal website. The design encompasses all collateral, business cards, letterhead, website, animations, signage etc.

The logo was based on a seven-by-seven grid. Using that same grid, the Pentagram team generated a simple Media Lab monogram to serve as the logo for the Media Lab. Then the Designers extended that identity to each of the 23 research groups that lie at the heart of the Lab’s activity. The result is an interrelated system of glyphs that at once establishes a fixed identity for the Media Lab, but celebrates the diversity of activity that makes MIT.

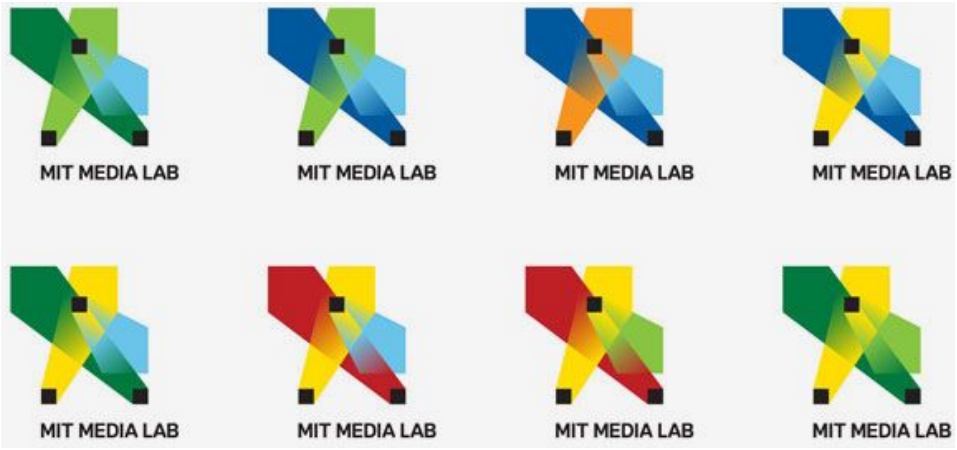


Figure 13 MIT 2011 Logo

5. Discussion

The topic of this research carries the weight of technology form from the day the term Generative art was keyed down by designers. This has caused a great weight to be on the researchers shoulders as it's easy to lose track of the topic and weir into another section without knowing it. Generative art and programming languages has opened a vast amount of possibilities for the people and the society in many ways possible.

The main challenge of this topic for the researcher was something that was not noticed at first, and that is how up to one's interpretation and view can be. Supposedly this can be said about every topic, but for this topic in particular, it was evident from the beginning that the researcher have to interpret and analyze each aspect on his own, but the scale of the topic and the research itself could have been jeopardized because of the reliance and trust the researcher must have on one's self. This was only maintainable because of the bits of specific information found in other researches that were available. Even so some of the researches lack the

specificity and concentration and some of the information needed to be extracted from within them.

One of the great highlights of this research for the researcher was to see that generative art is not a new thing that was developed by computers, but something that has been used many times before in history to create great things. on the other hand it was also highlighted the use of programming languages and how a game changer they have been in every aspect of our lives, and how it elevated generative art from what it was to what it can do in the society.

The understanding of how programming adds control to the artist and designer shows the thought process and how that can change different aspects of our lives. The deconstruction of the work from the functionality of the design to the location of each pixel, creates the possibility for people to rather than creating the work with other tools and constructing the work like a layered cake and view it from top, mold every aspect of the design to their need and create the work by truly being part of it's process and the work itself. In a more artistic sense of the matter, programming allows artists to be the tool builders of the work they want to create.

These advancements in design that has been allowed by programming has proven to be essential and can be applied to our everyday lives, either in form of Art, Entertainment, Branding, or Design. The influence in design is of particular importance in current time, as we are constantly trying to improve the traditional ways we use materials in our everyday environment and how we can make can build better and more sustainable products, either it's buildings and architecture to chairs and fashion.

The most notable works that was studied in this research was the works of Joris Laarman (figure 8) and how with generative art and programming, one was able to study the nature and how the nature grows and evolves to different shapes, and how one can take that data and create a simulation that allows a structure to be created that is more durable and strong and yet does not use as much material as it traditionally did.

One must not think that generative art is only designed to create artworks and logos and etc… . Generative art is a structure one will build around his chosen elements and makes the elements the occupance of that structure, and those elements will move according the needed design of the structure. The most recent entry to the generative art category, and proof of the use of such structures, was the game called *No Man's Sky (figure 14).*

Figure 14 No Man's Sky

This game was highly anticipated, mainly because of the system which it's was built on and what it enabled us to see and interact with. The system that allowed the creation of 18,446,744,073,709,551,616 planets with each planet with it's own creatures and unique look from another.

The designers surely won't be able to have the time to sit and create this many planets and this many creatures, so they use a generative system to do the work for them. The generative system gets the assets they have designed, for example, 50 types of legs, 50 types of heads etc… and put them in their system,

and just as Mozart created his Musikalisches Wurfelspiel (musical dice game) (Pearson, 2011) (Welton, 2014), they created their worlds.

Need to also understand that just because it's a system and that it's modern, does not mean that what it produces is always good and perfect, and need constant check and observations to be properly filtered, so the final product keep it's quality and won't have results as such as (Figure 15).

Figure 15 No man's Sky, String Cheese Jim

One of the other things that came to attention to the researcher, was during the interview with Matt Pearson. There was a discussion regarding Human Expression and can a work of art created with computers and code, be of same nature and level with an art for example designed by jackson pollock.

There appeared a ground that was not yet fully discovered by artists and programmers. In it's own sense it follows the same topic as difference between AI(*Artificial Intelligence)* and Humans. The question here has been, will an AI be able to become just like humans, and if no then why ? this question has been answered in many different ways, but one way that has been mentioned over and

over again, and it's relatable to the generative art and fine art, is that the Ai will be able to act like us, but will never be able to hold any of our metaphysical aspect.

metaphysics here is referring to our inner emotions and vibes that people are able to grasp without the need for a word to be said. Things as such between friends of family members who meet one another at a certain emotional stage, and even so if the person pretending to be ok, the other person on the receiving end of the vibes, is able to feel it and therefore react to it. This factor can also be questioned, by asking if humans metaphysical side, is also just mere lines of code that have been programmed.

The researcher believes that this discussion about generative art and human generated art, instead of actively trying to separate the human element and the computer element, both of them to be embraced and combined to create a better form of human expression.

Humans constantly are looking for new ways and mediums to express themselves and what they believe in and what they are about. Fine arts are a form of human expression and great artists have been using that for long time, to document either how they feel, where they are or what the state of the world is. Generative art can provide new means that maybe if combined with other mediums, provide a more detailed, or maybe an entirely new form of human expression.

During the research, it became evident to the researcher, what exactly has been the cause of lack of manifestos and instructions for generative art aesthetics. The thing that is holding the construction of the aesthetics for generative art comes from the nature of the topic itself, freedom. There is not a school in which they sit the designers down and teach them on way of creating a circle, specially with code, where the designer is the master of every pixel that is constructing one.

This freedom that coding and generative arts create, has caused each designer to have their own personal manifesto of what the design should look like.

Now some works are close to each other and therefore they can be categorized in a group but over all they all follow different principles. In modern day, with the speed of technology, and increase of population, there is not an so called era like before where a new for will rise and all follow that new form of art.

If an art style and it's aesthetics as it's monument is a circle, and years ago, we would have only one or two of them for each ear, today the society is constructed of millions of little circles with millions of their monuments.

One of the things that puzzles the researcher is the generative arts impact on the world of branding. Of course as it has been covered in previous sections about it's impact, but the main thing in mind is that to what extend the brand needs to be pushed in such way.

As it was indicated in the previous sections on how brands are implementing these forms of generative designs, but the researcher wonders if such focus changes to the brand, can cause the brand to loose it's identity, almost as if a person be referred to everyday with a new name, constructed by the same alphabet of his original name.

6. Conclusion

For such research, underlying singular conclusion is difficult, but that only stands up to what the nature of the research is. Generative art and programs that allows one to do such works are mere tools of the artist and is up to the artist to extract what is possible out of them.

Generative systems and programming have opened the gate for designers to be true creators in the sense of the word. That is absolute control over the systems they create and how they want their work to behave. On another note, as it was indicated by Steve Jobs that learning to program is like going to law school, it has elevated the designers minds and has drove them to think and to analyze their works,and even moving them out of their mere static forms.

The researcher has realized the scope in which such systems can work in, and how they can elevate human life beyond art, but also in life, design and architecture. These systems are to be used in many different forms today, as the environment has caught on to the digital world and social media and that in it's own nature, never remains static and constantly changes.

The aesthetics of generative arts for the designers community is of utmost importance, as there has not yet been a singular manifesto for such art. But the researcher realizes that considering in today’s logic, this specific topic can't have an yes or no or right or wrong question.

The process of creating and the process of coding are very similar, all demand thinking deeply about the concept that we are after, and in order to do that and learn and move forward, there is the need for communication and discussion with different people from different backgrounds. The elements of thought and communication are part of generative art, and maybe by nature, it must not have a singular aesthetic, but a collective form aesthetics, constructed by different people with different ideas, and therefore a constant thought process and communication among them.

7. Project Design Recommendations

The possibilities that opens with the Generative systems and coding, and how the research highlighted the difference between human expression and interaction with computer generated systems, and the blurred line between them.

The researcher came to conclusion that with such possibilities, the creation of a new form of human expression, one that is not controlled by hand, but by one's voice, or if pushed even further than that, with body vibrations is the next step.

Creation of an Audio Reactive Visual, or in another form, Audio Generative Visual. Making a software that analysis the sound and voice of an individual, and depending on tone and vibrations, creating a visual response.

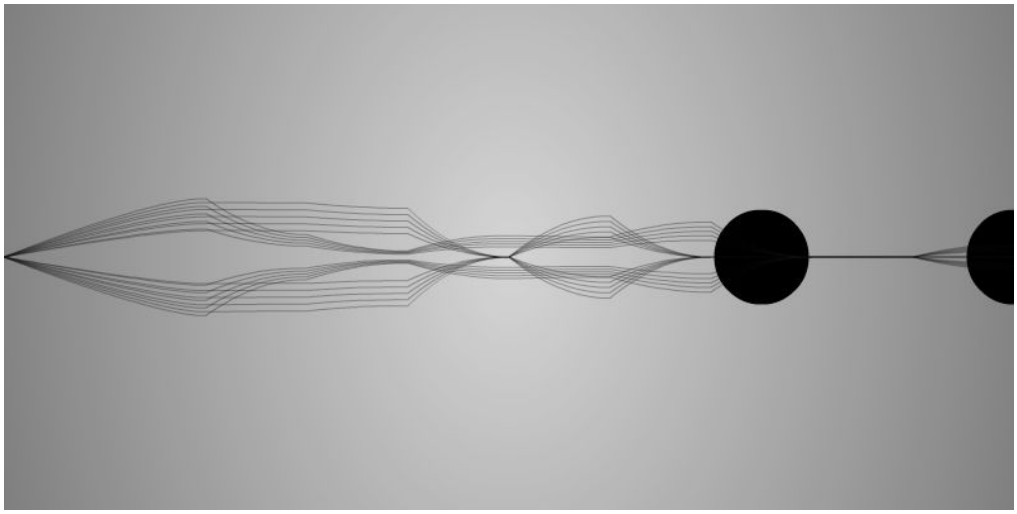


Figure 16 Radarboy Processing

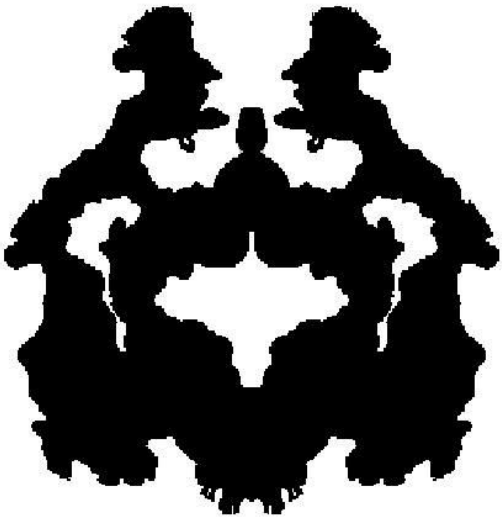


Figure 17 Rorschach Ying

The new form can allow a much more deeper way for art and design, and can allow for uses in fields such as psychology, and maybe a replacement or a companion for Rorschach Tests (Figure 17). With a society that is getting more and more driven visual, Work of such nature can be used in wearable techs and with correct data and a set of properly designed visuals, to show the mood and state of mind of individuals on a greater level.

Aside from a medical point of view and stickly looking at the art and design aspect of the work, it can be manifested in form of an Open Source website with an Open Source Library, where designers and artists can create works such as (Figure 16) and not only explore their creativity, but to contribute to the platform and the library, and allow the platform to grow with their contributions much like how Processing and P5.js platforms evolved by free contribution of creative individuals.

This project in it's own sense, will references what was discussed and that is, bringing creatives together by exploring what other mediums such as audio and on a grander scale as previously mentioned, body vibrations, for creation of great works of art and design.

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