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A.I. - Algorithmic Interactions

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University of Iowa

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A.I. - ALGORITHMIC INTERACTIONS

by

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A thesis submitted in partial fulfillment
of the requirements for the
Master of Fine Arts degree in Art
in the Graduate College of
The University of Iowa

May 2013

Thesis Supervisor: Professor Steve McGuire

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CERTIFICATE OF APPROVAL

MASTER'S THESIS

This is to certify that the Master's thesis of

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has been approved by the Examining Committee for the thesis requirement for the Master of Fine Arts degree in Art at the May 2013 graduation.

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CHAPTER I: INTRODUCTION

Three things that have always driven me to produce artwork are my curiosity, observations I have made, and a form of communication. The work that I am creating for my thesis show was derived from these three things. My curiosity leads me to explore new materials, ways of working, and technical knowledge that pertains to traditional art making as well as unusual and new ways to produce artwork. Observations give me content to mold my art around. And a desire to communicate those observations to another person drives me to create artworks. While most people communicate through language, I find it easiest to communicate through shapes and forms.

This thesis will talk about how I created artwork when I started graduate school, how my artwork evolved as I explored what art making meant to me and how my thoughts about art making has developed. I will then conclude with talking about the artwork I produced for my thesis show and how that work was shaped by my previous observations and artworks.

CHAPTER II: INITIAL ARTWORK IN UNDERGRADUATE AND GRADUATE SCHOOL

I have always had an interest in using computers and other technologies and this began to trickle down into my artwork. When I found out that lasers could be used to mass-produce designs I began to create objects that could utilize this process. The first works that I designed for laser cutting were a small photo holder that was in the shape of an octopus and a tray that was made from a flat sheet of aluminum. The Octopus photo holder was the first piece that I sent to be mass-produced in acrylic and aluminum.



Figure 1: Octopus Photo Holder; 2008; Aluminum, Powder Coating; 7"x5"x7"

During my last two years as an undergraduate, my artwork gradually began to utilize multiple small parts or pieces that could be combined to create a seemingly complex structure or shape. After I discovered how easy it was to have a design mass

produced I became even more interested in using software and technology in my work. I began to produce a series of lamps fabricated from 25 identical pieces interlocked together to make a three dimensional structure. The structure was designed by hand through trial and error. Many models were created and refined by hand until the final shape was made and sent off for laser cutting in thin plastic. Once the first prototype was created, this was further refined to create two more designs that were easier to assemble, but still based on the same structure.



Figure 2: Blossom Lamp 2009; Syrene; 15"x15"x15"

After these two lamps were created, I decided to move to fabrication in metal because I had just been accepted into the Graduate Metalsmithing program. This led to me changing the structure so that it could be connected using a nut and bolt instead of interlocking pieces. After making a few prototypes in paper, I began doing tests on metal to create the structure, until this was further refined so that I could make the first prototype by hand. After making the first prototype, I then sent this off to be laser cut in two different designs.



Figure 3: Nebula; 2009; Aluminum, Powder Coating, plastic; 10"x10"x6"

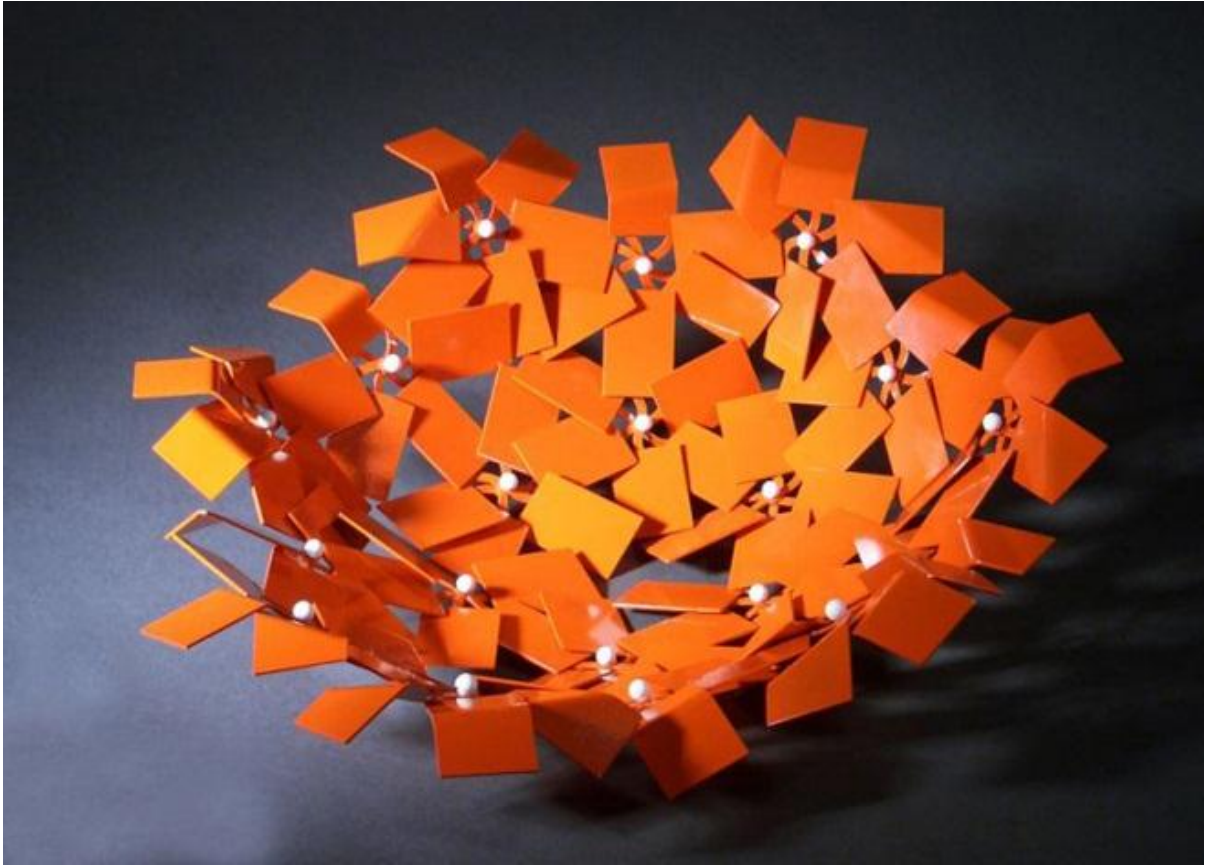


Figure 4: Nexus; 2009; Laser Cut Aluminum, Powder Coating, Plastic; 12''x12''x5''

Although I was producing work that people responded to, and were successful in competition and enabled me to show them in galleries, I felt that I needed to find an easier way to create objects. My aims were to speed up both the design and prototype production processes (so I did not need to make models by hand). At the time, I was not thinking about my work in conceptual terms, only from an aesthetic and design sense. This led me to start taking classes in 3D Design where there was a focus on digital design and mass production. I wanted to have a firm background in how shapes relate to one another and learn the visual rules that governed design instead of just relying on my instincts.

CHAPTER III: CREATING WORK USING THE COMPUTER TO DESIGN

When I first started taking classes in 3D design, I did not know how to use computer-modeling software. I could use programs such as Illustrator and AutoCAD to make files for laser cutting as well as some basic drafting, but my skills did not go beyond that. After spending a few semesters taking classes I became familiar with 3DS Max for modeling shapes and structures. While I enjoyed designing objects using modeling software, I also wanted to be able to see and touch real objects. The only way I could produce objects at the time was through 3D printing. This was both expensive and limiting because 3D printed objects could not be very large due to the available technology. After doing research on how to fabricate objects from computer models, I found software called Laminar that would fundamentally change how I created objects. This software allowed me to create three-dimensional objects in 3DS Max that could then be broken down into a shape that could be fabricated from flat sheets. Once the digital object was imported into Laminar software, the flat sheets that make up the object were labeled and a plan was generated for assembly and CNC cutting. This allowed me to create a new group of sculptural objects that started out as lamps and evolved into something different.

The first thing I made was a lamp that was made out of multiple small pieces that were assembled together and then expanded to make a form. The general shape came from 3DS Max and the template for the shape was generated both with Laminar as well as further refinement in AutoCAD.



Figure 5: Peek Lamp; 2010; CNC cut Paper; 7"x7"x9"



Figure 6: Sandstorm; 2010; CNC cut Paper; 15"x15"x23"



Figure 7: Navigator; 2010; CNC cut Paper; 12"x12"x28"

After making this first lamp, I tried to make a different form based on the same structure that was not symmetrical and was created out of many different shaped pieces. This resulted in a sculptural form that I created in 3DS Max that did not have a utilitarian function. This piece was assembled from CNC-cut paper that was glued together by hand to create the final shape.

Making this artwork put me in unfamiliar territory that I never considered before. I began asking myself why I enjoyed the object so much. Is it just an aesthetically pleasing shape, or is there more to it than that? What purpose does it serve? Why do other people enjoy looking at it and why does it get accepted to exhibitions in galleries? After all, it's just some paper that I glued together.

While I had these questions about my new work at the time, I continued creating more shapes that were similar. All of these shapes were just as interesting as the first, I could now go from idea, to modeling, to CNC cutting and assembly in less than two days. I even created them on a large scale for an exhibition in Michigan.



Figure 8: Cocoons; 2010; CNC cut Paper; 7'x8'x8'

CHAPTER IV: THOUGHTS ON MEANING AND CONCEPT

After about a year of making artworks this way, I began to feel lost and confused about my work. At times, I felt like a factory working just making shapes on a computer, cutting them out, and assembling them. The entire process felt cold and emotionless. It felt more like a science than a work of art. My works were still getting into shows and I even made a few sales, but I wanted more out of my artwork. The path that drove me to creating these objects was my curiosity to create things that I couldn't make before and now that I had the method to create the objects, they no longer seemed interesting to me. I began to question what I was creating.

Through the act of exhibiting, this also brought me to writing statements about my work for the first time. At first the statements were meaningless to me, just a pure marketing game for a gallery to sell my work. This felt really wrong. I began reading other artist's statements about their work. While some were useful and helped me understand their work, others seemed to be confusing, misleading and specious. Many left me more confused about the work than before I read the statement. I decided if I am going to write about my work, then I am going to write about what I actually feel and think about it. Otherwise I felt I would have no chance of being an artist because if I do not feel passionate about what I am producing and truly believe what I am writing about the work, then what is the point in making the work in the first place.

This led me to begin solving my problem. I started taking more art history classes to understand how other artists felt about their work and why art is important. I also began taking classes in sculpture to work with a different group of people that didn't

make utilitarian objects. While I love design and craft, I wanted something more out of my objects than just a function. And lastly, I began thinking about artworks that I would see at galleries, museums, and exhibitions to try and understand why they are being exhibited, or chosen, and why the artist created them. While doing all of this, I also began distancing myself from my previous body of work so that I could be free to explore new ways of working in hopes that I would one day come back to my old way of making objects but feel more engaged and connected with my work.

CHAPTER V: NEW DIRECTIONS

The first work I made to explore new directions was a simple balloon about the size of a person. I made this object with no more thought to it than that its size would create a relationship with the viewer since it would be proportioned like a body and that it would stand up like a cylinder and float across the ground. I made this work and filled it with helium and watched it for a few days. I watched it move around my house with the changing air circulation from the heating system, I watched it slowly deflate from the ceiling to the floor and move from one spot to another as if it got bored in one room and tried to find something else to look at. After about a week, the balloon slowly deflated and died on my floor. The creating of this object began to make me aware of one reason why I make physical artworks, which is to make something that I cannot fully visualize before its physical creation. I could not have realized how I would relate to the balloon until I created it and watched it move and change. This dynamic was one thing I realized was missing from my previous work.

The second thing I realized about this work, happened during the critique of it at school. During the critique, someone took the balloon and spun it into the air all the way to the ceiling and we watched it slowly drift back down to the ground. This spinning was something I never thought about doing with the balloon and made me realize another reason why I make artwork. Through the act of creation, I am able to connect with another person in an unspoken manner. When I exhibit an object, people react in unexpected ways, which I feel is part of my work since I set up the situation they are reacting to.

I continued with exploring new directions in another group of works that included scent as an element in the work. The first work was a painting made out of scented wax that was colored black but smelled like lemons. With this piece, I wanted to remove all visual elements of a composition and leave nothing other than the viewer smelling a commercial artificial lemon scent without any color to clue the viewer in on what to expect. When creating this work, I was thinking about Allan McCollum's work "Surrogate Paintings" (1978) that I saw at the Museum of Modern Art. These were solid black works that were hung to act as a prop for the painting to force the viewer to question the gallery as a stage for a painting instead of the context of the painting. When I first saw these paintings, I heard someone talking in the gallery who made fun of them by saying, "Look, I could have been famous if my mother didn't throw out my paintings that looked like this when I was a kid. This artist's mother must have held on to his for him". This made me question what people hang on the wall in their apartments and homes. Almost everyone has paintings and other images hanging on their walls in their homes, but it often seems they are displaying them because they are just trying to make their home feel less barren. At the Metropolitan Museum of Art I noticed the majority of the visitors to the museum seemed like they were on an express tour of the museum to see every famous thing as quickly as possible. I was in the modern painting wing and noticed lots of people walking through the halls and getting their pictures taken in front of Jasper Johns Flag, Warhol's Mao, and Rauchenberg's Bed. Most of these people didn't even stop to look at the work for more than a few seconds, they just stood in front of it, turned around, and had their friend snap a photo to show that they were there and moved on to the next. The only work that did seem to keep people engaged was a work

by Anish Kapoor that consisted of many tiny hexagons in a partial dome that reflected the viewer. This work had people flocking to it to interact with it.

After thinking about what I observed, I made my scented wax paintings as a way of making an object that couldn't just be looked at in passing but required the viewer to spend some time nearby and experience the work in order to make sense of it. This would trigger a reaction that I could not plan for since a scent could trigger any number of memories in the viewer that could be different from my own. I was also interested in what would happen if I took products that were marketed to make homes more comfortable and incorporated them into an artwork. This led me to make a second work that involved 42 apple scented Glade plug ins on a wall to make a overwhelming apple cinnamon smell in the room that could not be experienced until the work was initiated. There was an unexpected reaction to this work. While the apple scent was not offensive to me, maybe because I grew up with Glade plug-ins, many of the people who looked at the work had repulsion to the commercial scent. While at first, this was disappointing to me, because it became difficult to stay in the room for the critique, it made me realize that an artwork has its own life that is no longer under the control of the creator. All the artist can do is set up the situation and watch it unfold. While I may have one interpretation of what I created, that does not mean someone else's interpretation is wrong.



Figure 9: Red Square; 2012; Glade plugins, Apple scent, drywall, electric outlets;
6'x6'x0.5'



Figure 10: Detail of Red Square

CHAPTER VI: ALGORITHMIC INTERACTIONS – THESIS ARTWORK

After creating these two works, I decided to use these observations and go back to making work that would embrace the themes of my previous work, (combining multiple small parts making a whole, computer-aided digital design, and mass production) and combine it with the new conceptual thinking I have been developing in other artworks. To begin this new endeavor, I first started thinking about what things in my previous work could relate to new works, and what the meaning of those relations could be. The first relationship I began thinking about was the use of computer technology and how that is being applied to the artwork.

Computers were just becoming a powerful tool as I was growing up. I still remember the days when people didn't carry a cell phone everywhere, when playing a game meant you get out a box, read the instructions, and interact directly with another human. Today, people are digitally connected to one another more than they are physically. While we have the ability to make phone calls, this has now been replaced by the exchanging of notes in the form of a text message. We check in on our friends by looking at their Facebook profile instead of directly asking them and people become addicted to their electronic devices and feel like a part of their body is missing if they forget to bring it with them. This relationship with computer devices I find interesting and I wanted to somehow include this idea in my artwork.

The other thing I used in my previous artwork was the incorporation of mathematical relationships into my artwork. The majority of my artwork has a geometrical and logical design that is involved in it. I came up with a system to make

designs with many variations of artworks by making minor changes to that system.

While I didn't know it at the time, this could also be called an algorithm. It is a system of assembly or creating that I would follow to generate a form. An algorithm is nothing more than a pattern that someone or computer follows to get a result. Algorithms are also used to help target ads to users of the internet, program traffic lights, or trade stocks on Wall Street. Through the use of algorithms, a TV can begin to predict what shows you will watch based on what you have watched previously. In a way, technology is starting to behave like your mother who may not know all the private details about your life, but is familiar with you as a person to know what you need in life. This was also something I wanted to include in my artwork. I wanted to make an artwork that somehow connected to the viewer and reacted to them so that the viewer made the work become alive and the work connected to the viewer through their actions.

I also thought about what motivates me to make artwork. One of the most enjoyable things I find in making artwork is sharing what I created with other people. This enjoyment either comes from direct interaction with people and having conversations about the work or just from observing other people look at the work without ever meeting the person. This observation has always helped me move on to the next work since it gives me feedback on how to proceed.

After thinking about these conceptual ideas that relate to how I created my previous artwork, I came up with the idea to make an artwork that would be made up of a group of small parts that form a whole and would move and react to the viewer. By designing an art piece that changes based on the viewers' interaction with it, my aim is to allow the viewer to incorporate their actions into the artwork. My work is designed and

executed in the gallery, but the viewer is given the power to directly change my creation through their actions.

In order to create an artwork that reacts to the viewer, I needed to first come up with an object that could change. I wanted to make something that could have infinite possibilities to interact with by just changing the programming. I decided to make a sculpture that would behave like the iris of a camera. It could expand and contract which would be easily noticeable by the viewer. By making many copies of this, I could create a large interactive analogue computer screen or simply a playful interactive wall depending on how I hung the work. Through the use of small servo motors, a computer program, laser cut geared sculpture and some sensors; I could make an interactive work that could be programmed through the use of an algorithm to react to the viewer. When the work is hung, it will move and change based on an algorithm that I program into the work. This algorithm is a metaphor for my intent of the artwork. Through the use of sensor data, I will allow the viewer to directly interact and change that algorithm and allow them to alter my work through the act of viewing. This will be done through the use of cameras, infrared, or other sensors. The change that occurs will be a stand in to something I feel is important to my art practice which is to react to outside stimulus and change. I use my artwork to communicate with people and parts of communication are listening to others as well and have a conversation with the other person. By allowing the viewer to change my artwork, I am trying to create a conversation that has my creation as well as their creation working together to create the artwork.



Figure 11: Four shots of a part of the work at different stages of movement.

CHAPTER VII: CONCLUSION

Through this work, I hope to connect to the viewer in a way that is similar to the computer connections that people interact with one another today. I think one of the attractions that people have to social networks and similar technology is the ability to instantly communicate with friends and even strangers. Just by walking in front of the work and looking for a few seconds, they will have the instant gratification of interacting with the work that will hold their attention like the Anish Kapoor work I mentioned earlier. And through the use of an algorithm, the artwork will react to the viewer and change based on their movements and reactions.



Figure 12: Photo of the installation during my MFA exhibition



Figure 13: Detail of “AI: Algorithmic Interactions”.