Memories with Sounds (Paper)

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Abstract:

Music has inspired one and all for centuries. Fused with history through civilizations, music has essentially marked the memoirs of human life. Music is for celebration and dismay; for success and intrigue. It exhibits the likes and dislikes of a man, his culture, ambition, mood. Rather there is rarely an emotion or incidence of life which could not be associated with music. It also served to inspire this paper, which explores Generative Design through the lens of a musical score. Rhythm, beat and often lyrics involved as necessary components of music could inspire a distinctive piece of jewellery each time it is played. Through this paper, I seek to explore this relationship between contemporary jewellery through Generative Design based on music.

Sound waves made by music not only mesmerise our sensibilities, they could be used to make jewellery pieces. Using a code, sound waves are processed and with the help of 3d modelling and printing, exquisite pieces of jewellery could be created. The code could be assisted by the sound of a person who so wishes to sing a cover or create a tune or simply say the lyrics. Even a song which one would associate with a memory of life, a piece could so be created which would capture the memory in a tangible and permanent shape. As Celstino Soddu comments, 'Generative Design approach works in imitation of nature, performing ideas as codes, able to generate endless variations', this research would investigate how a singular algorithm could use different sounds and music to create endless results which would be unique in character, looks, attributes, texture and, most importantly, design.

Through former research projects, I managed to allow the designer and the end user to work together to develop a unique and customized product. This research emulates the same.

Introduction/Background:

Prior to the Industrial Revolution, manufacturing was considered a craft. Products were typically custom made to meet the needs of a particular individual. No two products were exactly alike, and parts from one product could not necessarily be interchanged with similar parts on another product. Since products tended to be relatively expensive, access was limited primarily to the upper class or aristocracy. With the advent of the Industrial Revolution and the concept of interchangeable parts, similar products began to be produced in large quantities and the costs were low enough that they became affordable for middle class.

Just as the craft era was replaced by the era of mass production, mass production is being replaced by the era of Mass Customization. Ikea, for instance, has been a front-runner in making home decorative items such as lamps. Different colours, shapes, and designs have all been made fairly affordable due to mass production. These lamps though depend on their setting and use to be different from the rest. Nonetheless, the product itself is not different on its own, which is only possible through Mass Customization.

For instance, Micher'Traxler in their project *The idea of a Tree* use a mechanical apparatus combined with solar energy to create three-dimensional products such as lampshades and benches. The outlook of the product would depend upon the weather and exposure to sunlight. Thus, a new and different product would be made every day which can be seen in Figure1.

Figure 1. Micher'Traxler The idea of a tree.

Ikeahackers.net is also a good example where it shows the difference between mass production and customization. Where we are calling Ikea as an example of mass production, Ikea hackers proves to be a good example of customization where people take Ikea products and customize them according to their needs. Hacks, as they call it on the site, may be as simple as adding an embellishment, some others may require power tools and a great deal of inventiveness. People submit their creations, with the hope of providing alternative ideas on Ikea products.

Figure 2, below shows an example of Ikea tables used as a way of display in an exhibition. This took place at the *Maison de l'architecture et de la Ville*,

a kind of cultural centre about urban developments in the city of Lille, France.

Figure 2. IKEA hacked for museum display

Thus, it is believed that with Mass Customization coming into the market, there can be a fundamental revolution in a society – in other words – people's relationship to their objects and to supply chain, can be changed. Moreover, it will change how they use their products. Therefore, the current era is considered to be of Mass Customization, and one of the approaches that could be taken to achieve Mass Customization is through Generative Design.

This project also sets as an example of developing jewellery through Generative Design. Making them customised yet mass produced item to be purchased. It also makes users feel part of the design as its them providing the sound/music for bracelets to be created.

The Investigation Process:

The investigation process to achieve my goal of producing a project based on Memories with sounds through Generative Design involved study of uniqueness and coding.

The first project was done to explore the idea of uniqueness by taking products of Ikea and making them unique to the end user by customizing them for each user. This was also done to explore what Ikeahackers have already been doing. As discussed in the Introduction, Ikeahackers take products from Ikea and

customize them to their use. It was an interesting investigation to learn how to bring uniqueness to a mass-produced object by examining the use of the object as can be seen in the figure below (Figure 3).

Figure 3. From mass production to customization.

The next two projects were done to explore, coding and processing in respect to Generative Design. This project (see Figure 4) was done to experiment with bringing the feeling of touch into Generative Design. By using touch sensors, Arduino board and processing software, end users were able to create unique art pieces. The natural processes of drawing by hand with human imagination and sense of touch and the interaction of these elements led to the development of new variations on each occasion. Hence, the intention was to explore Generative Design through Physical Computing and Programming. With this project it was possible to visualize a bridge between sense of touch and Generative Design. Touch sensors were used to draw lines by a mouse projected onto a wall. The pressure exerted by the user determined the intensity of the line. Likewise, the lengths of the lines were also dependent upon the user dragging the line.

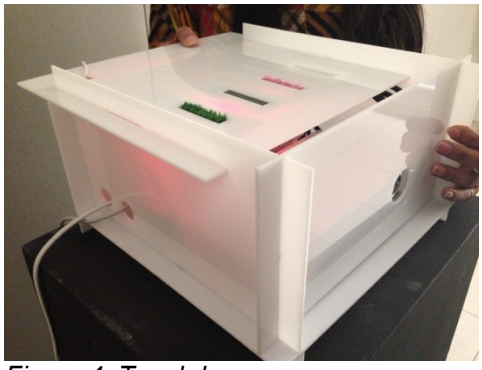


Figure 4. Touch box.

The second project was “Pulse has no identity”. With this project it was intended to bring emotions into Generative Design other than from our five senses; hence the use of pulse or heartbeat. Heartbeat of different residents living in Qatar over a certain period of time were recorded.

These residents participated in the design making since their pulse rate was being recorded thus giving them the confidence of contributing to the design. Thus, with this project the intention was to explore Generative Design through Arduino boards, Xbee, and coding. Furthermore, this project helped lead to the final project where users were able to be part of the design as it was their pulse which created the visuals moreover they felt more connected to the art piece.

Figure 5. Pulse has no identity.

Memories with Sound:

Memories with Sounds is an open design project. This project is designed to be uploaded on an open design website. Open design being a “New Design Wave” speeds up the innovation process, enlarges the access to design products through a self-production process. Data is shared through Vector files, 3d files and Instruction Codes.

The Inspiration of this project comes from sounds, which is a way of expression, it helps one imagine and repaint a picture – or live a moment again. I got a code online from James J. Grady. The code was tweaked and further developed for the project. Using the code, sound waves were extracted to be 3d-modelled and then further 3d-printed. The idea was to generate Jewellery Bracelets from recording the wearer’s sound or using the wearer’s favourite song to relive a memory.

This jewellery bracelet connects the creator (designer) with the (wearer) initiating a conversation with the viewer. Designer and wearer each play an important part in designing this jewellery piece as the wearer gives his/her voice and the designer uses it to create a jewellery piece.

Figure 6. Tweaked Code.

The code was then used in the processing software. The music was randomly stopped, creating an image which was further used in Illustrator. Every song or sound, produced a different image which could not be replicated. Several factors played a huge role in the output of the image. What sound/music was chosen and where it stopped impacted the final image produced making it unique and one-off.

The song used in the example of Figure 7 is one I used to listen to on my trip to Venice for a design project. I had developed an association with this song and hence every time the song plays, I recall my entire trip and moments I shared with my colleagues, my project and everything associated with it. Using this song as an example made the final piece of jewellery all the more special for me.

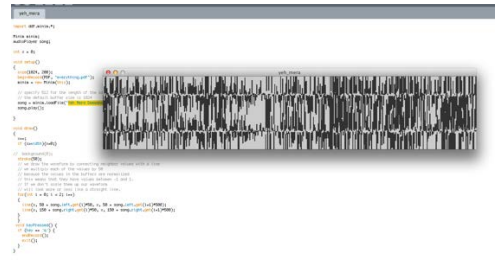


Figure 7. Using processing to play the code.

The image created in processing was further used in Adobe Illustrator to create a vector file.

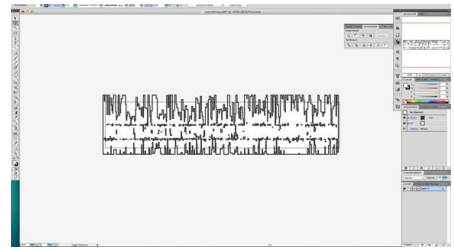
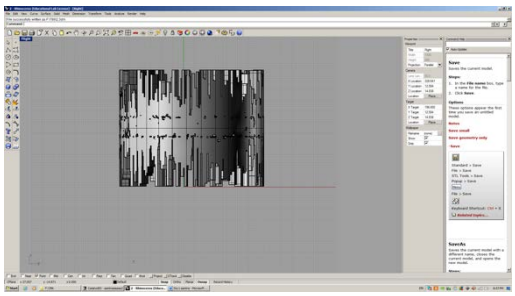


Figure 8. Using illustrator to create a vector file.

Illustrators vector file was further used in Rhino to make a three-dimensional bracelet that was further 3d printed. Rhino and illustrator are easy to use with little or no prior knowledge hence making it easier to be used in an open design

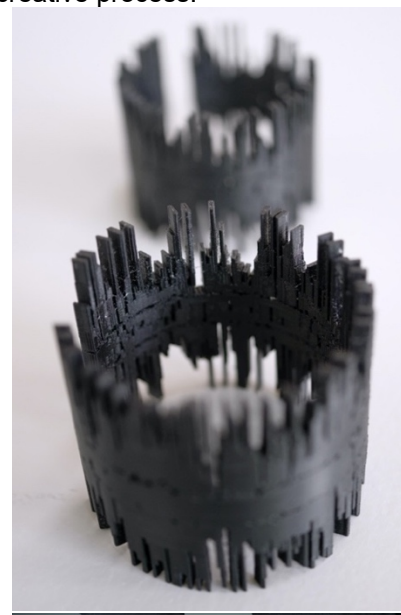


project.

Figure 9. Rhino image of the bracelet.

The choice of choosing the materials plays an integral part in this project. Wearer can use different materials available to him for 3D printing for instance: PLA plastic, copper, silver or even gold. Many more variations of materials are now available for 3D printing as well. This choice given to the wearer lets him decide the budget for the bracelet and also let him choose the final aesthetic of the bracelet.

For the purpose of this research, the bracelets were further produced in various materials such as leather and other two-dimensional materials giving a user more choice of materials to wear. For two-dimensional look of the bracelet, one can stop at the illustrator step seen in Figure 8 and laser cut the vector file in their choice of material. All of these choices give the wearer freedom of choosing the final look and create a piece which reflects one's personality. It also makes the wearer to be part of the creative process.



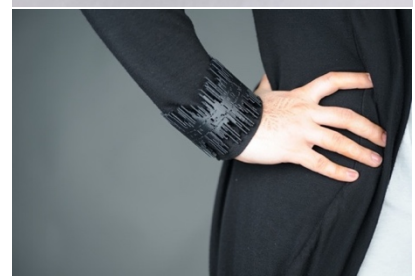


Figure 10. 3D printed Bracelet in PLA plastic

Figure 11. Bracelet made through laser cutting leather.

Conclusion:

The idea of making uniquely designed products in this paper – jewellery bracelets – which can be mass-produced, is new and unique. This product would be ground-breaking and holds the possibility of becoming quite a trendsetter. The elements of personalisation and uniqueness make this product highly attractive to a wide audience especially the young and the affluent.

In addition, this paper also explores emotions and feelings and how they could be used through Generative Design to produce jewellery pieces which give a new dimension to the attachment with jewellery piece. It may embody a feeling or sentiment, memory or just a trending chart topper, this jewellery piece would be a winner through and through. The variety of materials explored would make the product contemporary yet hold the element of being an heirloom.

This paper proposes a system that creates jewellery pieces, which are unique yet affordable, and mass-produced. This paper also highlights the existence of Generative Design in nature, may it be the pulse, the touch or the sound. The pitch, wavelength or frequency of a sound wave could all be reflected in the design form. Even the same song when remixed into a new score or composition would produce an astonishingly new and unique piece. This would hold the ability of adapting to age and cultural appropriation thus transcending in demand through the global market.

Additionally, we can take advantage of the already existing ideas to make unique products which have been exhibited in the market. This proves that tailor-made products are always in vogue and making them more affordable would only broaden their demand and likeability. It could be noted that the examples drawn are from lifestyle and home products because they are easiest to customise and have a broader usability. The same inspiration could be extended to jewellery as these pieces would have a more personalised approach and use. With 3d-modelling and printing, the product becomes all the more creative and well-executed while remaining affordable.

This paper aims at contributing to the evolution of Generative Design. The dissimilarity embodied in Generative Design makes it the present and the future of art. Fabrication at mass scale is essential to keep costs low but homogenous products would never become a trend as they lack attractiveness and uniqueness. They lack personality and a dimension of proprietorship. Without customisation, it would be difficult to imagine what our future generations would use to gauge

our personalities, history, culture and lifestyle. If the same is possible with a cost-effective and quick process with guaranteed different results on every attempt, it would be without doubt that Generative Design and pieces such as jewellery would be definitive of future trends and be a solution to monotony.

List of Figures:

All work and images by the author unless otherwise stated.

Figure 1. Micher'Traxler The idea of a tree, 2008, http://www.mischertraxler.com/projects_the_idea_of_a_tree_recorder_one.html#

Figure 2. Ikea hacked for museum display, October 4th, 2013, Judith, http://www.ikeahackers.net/2013/10/ikea-hacked-for-museum-display.html#s3ls2xVsDlrl4yQ8.99

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