

3D PRINTING AS PAINTING

Tiwánee van der Horst, Architecture graduate from the TU Delft received an honourable mention and a 10 for her graduation project. I think it's safe to say that when you receive a 10 for a project you must have done something good. However, what makes this project so special? What makes the difference between a 9 and a 10 or even a 9.8 and a 10.0? Her professors answered that question by referring to her use of 'emotion'. It is that small touch that makes a world of a difference.

by Christianne Francovich

Emotion can be reached in many different ways and on many different levels. A generally accepted method of conveying emotion, is through art. The Oxford dictionary defines art as: a visual form appreciated primarily for their beauty or emotional power. So if the 'function' of art is beauty and emotion, what is the 'function' of design? Is design, or architecture for that matter, primarily for practical purposes?

My first reaction to that question is 'no, of course not', good design should also trigger certain emotion amongst its users. There are millions of studies revolving around user experience to prove that. Additionally, designers such as Daan Roosegaarde walk the line between art and design daily. However, how thin is that line? Or maybe we should look at it the other way around; how large is the overlay between design and art? Is it as large as we want it to be or is it possible to conduct

rules for when something is considered art or when something is considered design engineering?

Here at the TU Delft we love facts and figures. People in general love being able to put things in a box; 'this is black' and 'this is white'. Life would be very easy if it could be categorised like that. If that is possible or not is a notion we should agree to disagree on because there are simply too many ideas on this subject. This however does not stop people from trying to categorise the world. Tiwánee, for example, does the same with her project. Her project takes the fairly new technique 3D printing and places it in the already established, some may call it rigid world of Architecture.

I am not an Architecture student myself but I have always imagined architects as grey old men designing static Roman buildings, very juvenile I know, however I have not been able to shake this image until ►

Tiwánee presented her project to me. She takes 3D printing to a whole new level and in my opinion creates a vision that will revolutionise the world of Architecture. Her way of thinking could influence many disciplines of the TU Delft, especially Industrial Design Engineering. Tiwánee started her project by researching the architectural potential of 3D printing. From this moment on, Tiwánee was walking on fairly untouched ground, thus forcing herself to create a new architectural language around 3D printing.

“the machine as the painter & the nozzle as the brush”

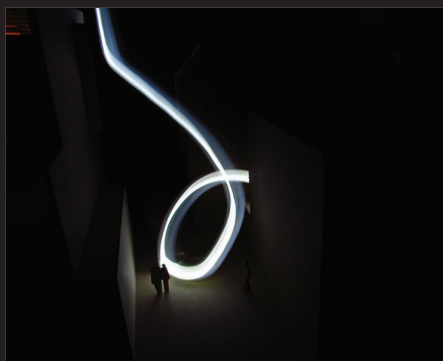
Her project is all about imagining an architecture movement not constrained by the contemporary production methods. By comparing 3D printing to painting she created a clever analogy; the machine as the painter, the nozzle as the brush, the building material as paint and material properties as pigments.

Let’s take a look at the first analogy; the machine as painter. In other words, the machine is compared to the bodily movement of the painter. Through intuitive experiments, inspired by painting techniques of great artist such as Van Gogh, Tiwánee has tried to capture movement. The pictures displayed on these pages are examples of how she captures movement by using light.

The material, however, has another analogy; namely paint, especially the movement of a material between the liquid state and the solid state. Tiwánee experimented with many materials and compared different solidification states, finally after months of research she ‘created’ a hypothetical material which combines all of the needed material properties; taking inspiration from existing materials such as plastic and paint. Plastic is engineerable through modification of additives in that way it is possible to change mechanical properties and for example to define the structural capacity of a printed material or to make a printed material transparent.

These mechanical properties are aspects of the design that can be ‘controlled’ and this fits well into the world of an engineer who wants to know the consequences of certain choices beforehand. However, these mechanical properties combined with the capturing of movement creates an unknown consequence and with it a certain unpredictability. ▶





When combining art and engineering, “precision flows over into vagueness creating a certain atmosphere in which the duality becomes visible” Tiwánee explains.

She concludes her research with saying that 3D printing or other digital fabrication methods will not revolutionise the architectural practice in that sense that it will become the best method to work with. However it did inspire her “in terms of what we can learn from the art of painting to denormalise and destabilise the engineer inside the architect and with that bring out the artist.”

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I really like the phrase “to denormalise and destabilise the engineer inside the architect.” Because I believe the same is true for designers. By thinking out of the normal guidelines that the TU Delft equips you with, you can create things with more value than someone who follows the ‘ordinary’ rules. Exploring a more creative side of design will influence your work significantly, and in my opinion will help it rise above. Design then becomes a combination of rationality and intuition, of precision and causality. ■

If you are interested in Tiwánee’s project and want to read more, her complete thesis can be found at: <http://repository.tudelft.nl/>

THE BLURRING CONFINEMENTS

OF THE DIGITAL AND PHYSICAL WORLD

Since the invention of the first computer in 1936, our lives have changed drastically. This machine has undoubtedly influenced our mental and physical world in a manner we can hardly comprehend. New technical innovations are still happening all the time and at rapid speed. This of course is something, we designers hear so often our almost immediate reaction is: "Please, as if I do not know that!". However do we? Do we fully understand the task that is ours to complete that comes with the digitalisation of our surroundings?

by Christianne Francovich

Industrial Designers have studied the principles of ergonomics for hundreds of years. Guidelines have been devised to ensure maximum comfort during use of a product. Entire studies revolve solely around how our limbs move and behave. Since the arrival of the laptop, iPhone, iPad etcetera the use of ergonomics has become more important than ever. However, for how long will this be the case?

Humanity has experienced amazing technological advancement in the last few

decades. We already have photorealistic 3D simulations and it's getting better every year. If you assume any rate of improvement at all, then the games will become indistinguishable from reality. Thus, the days of sitting in front of a computer in a compromised position are going to end. We are moving toward a world where our surroundings are seamlessly going to interact with the user. This is a future that is not far away; currently products like Knocki, that turns every surface into a touch pad, and Siri home systems - ask your house a

question and it will answer!, are raging the internet on websites such as Kickstarter.

So, what is in store for us in the digital future and how will designers have to deal with this in the sense of ergonomics? At the moment it is not going to be world altering to design a chair or another ergonomically justified product. These designs are based on the electronics we use, such as laptops, and because that technology is going to change so rapidly, it will become waste in a matter of years.

Paul Rand once said: "To design is much more than simply to assemble, to order, or even to edit; it is to add value and meaning, to illuminate, to simplify, to clarify, to modify, to dignify, to dramatize, to persuade, and perhaps even to amuse." He made this statement in a time where there was no such thing as User Interface Design or 'digitalisation of our world'. To illustrate, that year (1996), was the first year there were more e-mails sent than postal mail. Consequently, we can assume Rand was talking about physical products, however

his statement is still valid, especially in a world where everything should have added value. We do not have the capacity to harbor useless products in this already plastic filled world. A meaningful world has to be designed and that is our task, the task of young designers within a rapidly digitalising society.

We need to focus on guiding the merging of the digital and physical world of product design. The creative breakthrough in the field will ultimately be when designers can

merge the physical and digital world of design, in a variety of situations, in the simplest way possible, to create meaningful products.

The statement above sounds vague and a bit cliché. However, it is not possible to make a more sound conclusion because no one knows exactly what the future will bring. Will we transit into a world without computers and laptops but for example have electronic tables. Or will we all wear glasses that portray a new reality (such as the HoloLens)? This uncertainty of the future brings along difficulties for designers to decide what to focus on; is it important to specialize in User Experience of physical products? Or will everything be digital in the end, making it more beneficial to specialize in programming and User Interface Design. Who will say?

This is not a new trend in the world of design; since from the beginning of mankind the world has evolved and changed constantly. Darwin's theory knows that we will adjust to whatever the future brings. To be the best designer possible the only thing you can do is adjust and maybe even go with the flow. What we can do is study new patterns of behavior that come with these new technologies. Because only by doing that we will benefit from the range of possibilities that technology provides. We must be aware that not only our physical position will change, our mental state will also be challenged every day to adapt to the new. ■

THE ONLY RISK IS WANTING TO STAY

Most individuals I have told about going to Colombia react extremely biased. It is no secret that Colombia is still associated with drug cartels, kidnappings and violence. The best response I got was from someone who said, "Colombia? Voluntarily?!".

by Christianne Francovich

Truth be told, these people have never been to Colombia, probably they have never even been to South America for that matter. So their judgement is not the most reliable, especially since their only source of knowledge is the television series Narcos. Nevertheless, Narcos is a way in and to understand distant lands we need a way in – whether that be celebrities, landmarks or historical events. For some, viewing Narcos will reinforce the image of Colombia as a narcotics state. But, for others it will spark interest. In short, it would be safe to say that before leaving for Colombia I was expecting a major culture shock.

After my first two hours in Colombia my perspective had already changed. It was now: Colombia, the country associated with drugs, Pablo Escobar and the FARC, but also the country with beautiful scenery and lovely people. To be able to explore this country and hopefully move away from the stereotypes, I am going to compare it with a country I am familiar with, namely the Netherlands.

Cultural similarities:

Firstly, what are the cultural relations between Colombia and the Netherlands? Or in other words, what do the Netherlands and Colombia have in common? To be very blunt that would be: drugs and the Spanish invasion. I will first explain the

latter. As a former colony of Spain, the Colombian culture still has many Spanish influences. One of the most important influences being the language. In the Netherlands, the Spanish influence is not as significant as adopting an entire idiom. Nevertheless, Dutch vocabulary has a few Spanish expressions embedded into it. For example, the Dutch use the saying: "En daarmee basta!" translation: stop it! or "onder embargo" when someone is sending you something confidential that can not be shared with others. The Spanish influence has even made its way into our national anthem: "den Koning van Hispanje

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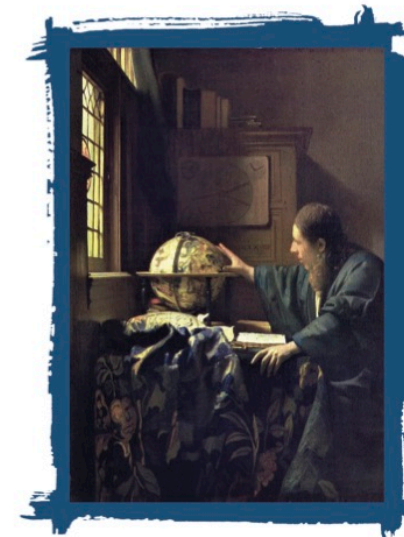
heb ik altijd geëerd" translation: I have always honored The King of Spain. In addition to language, religion is another field in which the Spanish culture had a great and lasting influence on Colombians. Today seventy percent of the people in Colombia are Roman Catholic. In the Netherlands, almost 12% of the population actively adheres to the Roman Catholic

church, however, you must keep in mind that over 65% of the Netherlands has no religious affiliations.

Furthermore, the countries both have the subject of drugs. As the Netherlands holds its role as possibly the most liberal nation in the world, coupled with its overwhelmingly positive international image, it would be hard for anyone to see their policies or procedures causing any kind of problems. However, let us be honest. Because the police and courts operate a policy of tolerance towards "soft" drugs, the Netherlands has become a tourist hot-spot for people seeking cannabis from countries with stricter controls of substances. It is not uncommon for foreigners to assume that all Dutch citizens smoke weed and take it with them everywhere they go. Colombians experience the same assumptions related to cocaine. Both countries find these prejudices annoyingly ignorant and, specifically in Colombia this ignorance will be met with the word: 'gringo'.

Differences portrayed in art:

What are the cultural differences between Colombia and the Netherlands? To answer this question we will explore the arts because paintings can capture a culture like no other. Let me explain. The 'Dutch masters' are a true phenomenon, including artists such as Rembrandt, Vermeer and Van



Gogh. Dutch artists created paintings that offered insights into history and commerce. They painted every facet of daily domestic and social life in "genre" paintings, one of the most characteristic categories of Dutch art. A famous example is 'het Melkmeisje' by Johannes Vermeer. These "genre" paintings are in my opinion a true symbol of Dutch culture. Daily, normal activities, are the ones that define a culture to its core.

'The activities of everyday life are the ones that define a culture to its core.'

Colombian artists have more recently begun to establish a name for themselves. The changing political climate in recent years has opened up different dynamics and allowed more freedom. Religion and family are two of the core values for traditional Colombians. Thus, the art reflects it. I will use the following two paintings to illustrate my example. Left is Francisco Antonio Cano (Horizontes, 1913) right is Vermeer (the Astronomer, 1668).

The first painting symbolises the discovery of Colombia by the Spaniards. The male figure in the painting is pointing to the horizon that is similar to the one painted by Michelangelo in 1483. One would assume this is a reference to religion. The second



painting, depicts an astronomer looking at what is known as a celestial globe, a globe that depicts the sky, the constellations. For being painted in 1668, this could be perceived as very anti religious for its time because it focuses on the scientific configuration of 'heaven'.

Differences portrayed in stereotypes:

If you were to encounter a Dutch person on a trip in a foreign country and ask about their home country it is very unlikely they will mention only good things. More likely the conversation will go something like this, "Yeah, it rains all the time!" or "Yeah, it is completely flat and everything is artificial." and "People to complain and are rather blunt.". Whereas when asking a Colombian person about their home, they will respond full of positive energy! This difference is not because Holland is a rotten place to live, but rather because not a lot of people identify with being truly Dutch anymore, we are all perceived as individuals that are not formed by the country they live in. Colombians are more tied to the roots of their country. Being Colombian means something and they take it extremely personally when someone speaks badly of their country.

Finally, the Colombians are fighting hard to destroy the bad reputation of their country. The Narcos series is therefore hated throughout Colombia because of its negative depiction of the country and the

somewhat heroic position in which Pablo Escobar is placed. I cannot help but say that the series sometimes does correctly show the pillars of the Colombian culture. In the series Pablo Escobar clearly shows that family is very important to him, he is a real mama's boy. Also his love for the country is pointed out more than once.

'Provoking discussion, is that not a value in itself?'

To conclude, I immediately fell in love with Colombia: the sweet and hospitable people, the versatility of the land, cultures and climates, the beautiful nature and the energy and vitality that radiates the country. All of the positive, stereotypical things you hear about the Colombian culture, such as strong family bonds, are true. Even though the goal of this article was to step away from the stereotypes I have realised that when you encounter a positive one you should embrace it. Even the negative stereotypes should not too quickly be shaken of. Once again, taking Narcos as an example, the series portrayal of Colombians might not please everyone, but it does provoke discussion. And is that not a value in itself? Of course, individuals, are much deeper than stereotypes, however, we are all guilty of using them. I believe generalizations help to explain a culture and they help us celebrate our differences. ■