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POINTS OF ARRIVAL

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AN EXPLORATION ON HOW TO TRANSLATE AND USE THE PRINCIPLE OF POINTILLISM TO MAKE THE USED COLOUR IN THE EXTERIOR OF ARCHITECTURE CONTRIBUTE TO THE VERSATILE EXPERIENCE OF ARRIVAL

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POINTS OF ARRIVAL

PREFACE

Dear reader,

The focus on colour in the exterior of architecture comes from a very personal interest. Ever since I started architecture school I've wondered why (many) architects, as mostly creative beings, seem to have such a monochrome vision on the built environment, which presents itself in their proposed designs, as well as in their clothing style. Having a black turtle neck is of course an architect-stereotype, but quite an accurate one. Even though I understand the various 'architect-perspectives' on why not to use much colour in both designs and lifestyle (owning two black turtle neck sweaters myself), it intrigued me enough to put my full graduation project in the light of colours in the exterior of architecture. I really wanted to get an idea of possible ways to create colourful architecture with a similar level of aesthetic value as other well-appreciated projects of our time.

Since the topic of colour in the exterior of architecture wasn't covered in any of the offered graduation studios in our faculty, I applied for the Explore lab. Admitted there, I got the chance to explore my topic and follow the way of working that fits best to my creative process of design and research. Therefore, I wish to thank my tutors Peter Koorstra (design), Wing Yung (research), and Matthijs Klooster (building technology) for listening, understanding, knowing, motivating and guiding me in the past year.

I hope that my research can be an inspiration for other architects and a small step forward to a more colourful architectural environment.

Vera Baerveldt

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EXPERIENCING ARCHITECTURE

Introduction

To experience a building you go through a process of different phases and stages. What you first see starts as a vague idea; it's a building, in a street, with trees, but besides the silhouette, all other information is blended into one far away mesh. While approaching the object, it slowly turns into a first impression; the mesh becomes an object and the information starts to show their own characteristics. The object has a colour, a plinth and a different top. Once close enough, it starts to reveal new layers of information. Layers that were first unable to be identified, now show the depth of the object. The colour of the façade comes from the used material, the material has a texture. The texture and material match or don't with the material of the window frames; window frames that lay back, rather stick out, create rhythm, mirror the sky, give comfort.

The approach of a building is a step by step discovering process. The closer one gets, something new gets revealed. Therefore, the experience of the building changes simultaneously with the changing position of the observer. In the boundaries of this research, this changing position of the observer will be simplified to the distance between the observer and the building. Besides the distance having an influence on experiencing the building, there's numerous other elements that have an effect on it. It is about seeing or not seeing. But what is there to see? Building elements such as the silhouette, the colour, the plinth, the top, the material, the texture, the windows and the rhythm all have their effect on the (changing) experience of a building. In this research paper, the main focus will be the topic of 'colour' above all other elements; Colour in relation to the discussed distance variable between observer and building.

COLOUR IN ARCHITECTURE

Colour in the exterior of architecture is most often a coincidental side note or result whilst the other named elements are well thought through in the design process. In all the design studios that I attended in the last 6 years in university in both bachelor's and master's education I never encountered a tutor that made me actively think and decide about the colour that my design proposal should have. Possibly a few times we spoke about the choice of material and with that the resulting (material's own) colour, but it was never the other way around. I never decided on a (non-material's own) colour after which I tried to find a suited material to provide the desired expression of colour. I am convinced that this is not because my tutors didn't like colours. I think they never questioned because they didn't get taught on the topic either, just like me. We learn a lot about spaces, structure, building volume, façades, façade openings, materials and many other elements, but colour is often a result of the above instead of a conscious decision. Most architects don't know what to do with colour. They don't know how to make decisions regarding it and that's why they often don't. Colours have a big influence on their surroundings and its users, but it remains unclear

and unexpected what the exact consequences are. Therefore, it is better to 'not burn ourselves' or hide behind a 'less is more' or 'the people add the colour' excuse. All things that don't have to be excluded if we would educate ourselves on the matter.

> *"Much has been written on colour theory and science, but little on the everyday decisions made by architects who may, sheepishly, admit that their use of colour is uninformed and somewhat arbitrary." (McLachlan, 2012, p. ix)*

In the few cases where colours are deliberately used nevertheless, they are often too simplistic for the complexity of the world we are designing for, too permanent for the instability of it and too direct, concrete and intense for the individuality that is needed for perceiving our surrounding. In these cases, architects have difficulties giving their inspiration (for the use of colour) the same amount of abstraction as they do for the inspirations on the other design elements. An example of this could be the Blood Center in Poland, by FAAB Architekture Adam Białobrzeski (figure 1).

Figure (1): Blood Center by F A A B Architektura Adam Białobrzeski & Adam Figurski, Raciborz, Poland (Architizer n.d.)

The inspiration of 'blood' is not translated, but directly applied by attaching permanent coloured panels, with the most blood-alike colour, in the most confronting element of the building (the façade) in the most dominant way (covering everything).

Because of this lack of knowledge among architects, the focus of this project on the approach of the building will be colour. The goal is to understand how colour in the exterior of buildings can influence and enhance the experience one has when approaching a building from far away towards the entrance. Therefore, the question of this graduation project has been:

"How can the used colour contribute to the versatile experience one has while approaching a building from far away towards the entrance? "

Within the project, in order to answer the question above, the research project is focusing on the method of colour use, while the design project focuses more on the theme of the sequential process of arrival. After an introduction on colour, both the research- and the design question will be posed.

COLOUR

When trying to get a grip on what colour is and what it can do, many different theories and approaches appear. The scientist Isaac Newton would define colour as the property of an object that is determined by the wavelengths of light being reflected or emitted by it (1666) (Nassau, 2023). Johannes Itten identified in 1921 seven fundamental categories that create contrast between colours: hue, light-dark, cold-warm, complementary, analogous, saturation and extension (Color, 2019) but also developed colour theories which included both the scientific and the emotional aspects of the phenomenon in 1961 (Itten, 1970). Since colour psychology took off in the 20th century, it has been researched and applied in many different fields. The theory where colours are connected to accompanying feelings, emotions

and behaviour is used for example in hospitals to promote patient recovery, in marketing to communicate the brand personality, for food presentation to spark up the appetite and in signage to warn people about danger. These last theories might all be differently approached depending on one's cultural background, which shows again another field of colour research (see appendix 2, pp. 10-11).

In order to understand the basis of the artistic possibilities colour has, painters and their work through history were looked at. Asking questions like 'What is their method of painting?' 'How do they deal with colour in their work?' 'What do they have in common?'

Rembrandt van Rijn is one of the most famous examples of using a technique called Clair-obscure, the technique of creating a great contrast between light and dark in paintings. In the 17th century, this was a common way to create depth in the two-dimensional surface and put the emphasis on the light objects. Even though the technique is not falling or standing with the use of colour, the colours that were part of the 'light' objects, got the most attention and played a big part in the total image of the piece (figure 2).

Figure (2): De Nachtwacht by Rembrandt (1642) 3,63 m x 4,37 m. (Rijksmuseum, n.d.)

Figure (3): La Seine á la Grande-Jatte (1888) by Georges Seurat (Geleyns, n.d.)

About two centuries later, a more scientific-based technique emerged: Pointillism & Divinism. Painters such as Georges Seurat used the placing of tiny points or stripes of different unmixed colours in the canvas instead of mixing the colours before the application. This created the perceivable colour only afterwards. The eventual colour gets mixed in the viewer's mind instead on the canvas (figure 3).

Figure (4): Cathedra by Barnett Newman (1951) 243 x 543cm. (Stedelijk Museum Amsterdam, n.d.)

Less than another hundred years later, the Color-field movement (1940-1965) nominated another view on how to use colour in the art of painting. Painters such as Mark Rothko, Barnett Newman

and Ellsworth Kelly are great examples of this specific movement in which colour gets treated as the main subject of the art piece. Colour is not just a tool for the painting, but it is the topic of it. The paintings are a documentation of constant investigation on the depth and intensity of a colour. This was done by applying layer after layer, searching for the right basis and accents in order to create the desired end result: a colour (figure 4).

All these paintings use colours. For some paintings, the specific colours are more important than for others, but they all have one thing in common. The use of colour affects the creation of depth in a painting. It is not primarily about which colour is used, but rather about the characteristics of the colour such as the light, the composition, the intensity and the layering. These characteristics create a certain depth in the colour, which makes it come to life. It provides for an experience; something to discover, the closer one looks. No absolute facts, but versatile experiences and activation of the imagination.

ARTISTIC GOAL

This creation of depth in colour is my artistic goal of using colour in architecture. When looking at colour theory in the architectural realm, much is done with the interior use of colour and also the topic of natural colours of materials has been covered extensively. As described above, the colour focus of this research lies in the exterior of the architectural design. So, besides knowing what the use of colour can mean for the spatial interior qualities of the design or how the user of the spaces might feel while inhabiting it, the exterior possibilities of colours in architecture will be explored. This exploration is done by answering the following research question in this paper:

"How can the painting technique of pointillism be translated into a way of using colour in the exterior of architecture?"

The outcome of this research will be used in the design proposal that follows from answering the following design question:

"How can the design provide for a sequential process of arrival?"

Meaning that the design will search for ways to give the observer a different experience depending on how close they are to the building; Providing the observer with a versatile experience.

Together, the research- and design questions answer the earlier posed question of the graduation project. *"How can the used colour contribute to the versatile experience one has while approaching a building from far away towards the entrance?"*

VISUAL RESEARCH

As mentioned, there are many different ways to approach colour in architecture and therefore this research started off with creating a framework of potential topics in the field (appendix 2, pp. 10-11). The framework includes the topics mentioned earlier this introduction, but also topics that were discovered during a project analysis of 50 colourful buildings (appendix 1, pp. 8-9 & booklet). The full framework shows all topics found, with on the right the topics that this research will no longer focus on (such as natural material colours and cultural context) and on the left the topics that will form this research's boundaries (for example bigger scale architecture, urban context of a western European city).

The project analysis shows 50 architectural projects that use colour, all over the world. The booklet in which all projects are combined forms an inventory of what is done in architecture and what methods and tools show potential for the goal of creating depth in the colour so that a versatile experience is possible. Each category in the booklet, shows a property of using colour that does not allow for this goal to be reached. That way, the projects left at the end of the booklet are projects that actually do achieve the goal. They show a

certain way of using pointillism in their method of colour application. Many different colours are used, each colour on their own element, but all elements together form again a new blended colour for a facade. Depending on the observer's distance, they experience the separate colours or the newly blended colour.

Figure (5): Museum Brandhorst in Munich, Germany. (Sauerbruch + Hutton, n.d.)

Figure (6): The Yardhouse in London (Grandorge, D, n.d.)

This phenomenon of seeing something different, depending on the observer's distance, asks for deeper research. How does pointillism in architecture exactly work and how to interpret it for further steps in both research and design. Through visual examination, this research will conclude on what the usable characteristics are and what the influence of distance, colour choice and pixel size is in this technique. A definition of 'the pixel' is made, where after different interpretations are again tested and observed. This leads to insight into how to use pointillism as a method of colour application in the exterior of architecture.

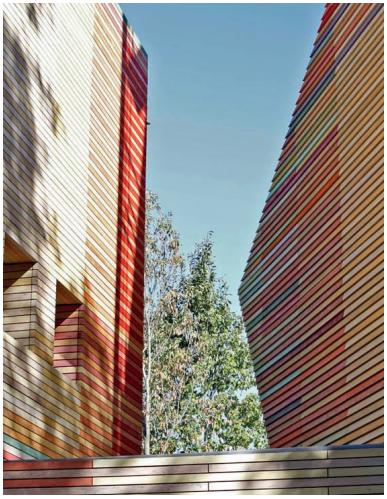


Figure (7): Auditorium for L'Aquila, Italy by Renzo Piano. (Caselli Nirmal, n.d.)

THE PIXEL OF POINTILLISM

Chapter 1

BLENDING COLOURS

As explained in the introduction and visible in figure (8), pointillism is a technique where many small differently coloured spots are together perceived as one new colour. A colour that shows depth in contrast to the same colour result that wouldn't consist of these spots. The new colour emerges when the coloured spots are no longer identifiable as individual objects, due to the too great distance for getting the objects in focus. The individual colours 'blend' into a new colour, from now on called 'the blended colour'. The distance that is needed between the surface and observer to get to this blended colour depends on the different used colours for the pixels and the size of the pixel. This can be concluded from the physical testing of pixel sheets of four different colour pallets, each in three different sizes (figure 9).

The bigger the pixel, the bigger the distance between surface and observer needs to be in order to just perceive the blended colour (figure 10).

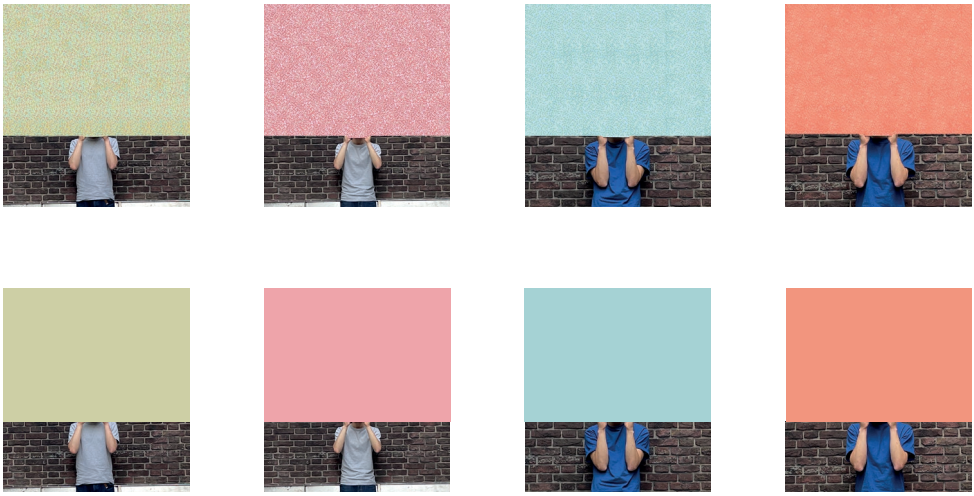


Figure 8: Four colours build up from pixels vs. their non pixelated version. Own material.

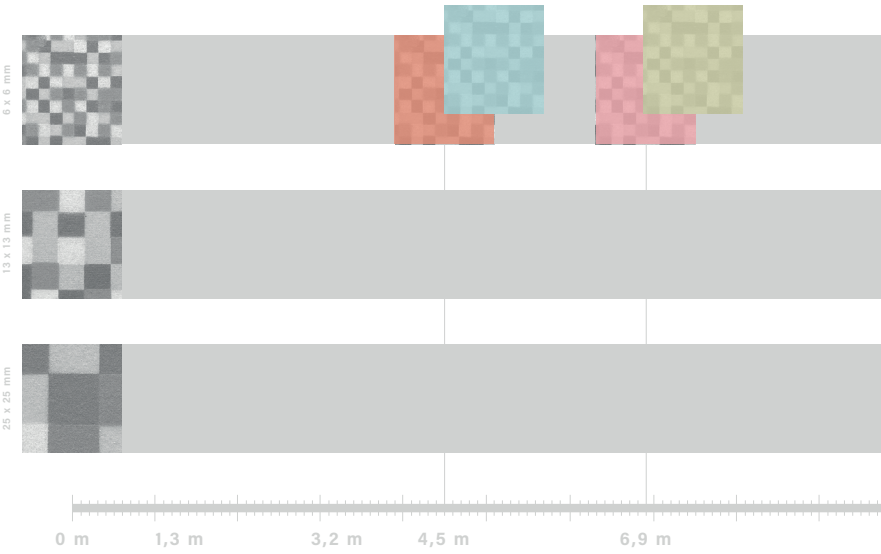


Figure 9: Four colour pallets, three sizes and their blending distances. Own material.

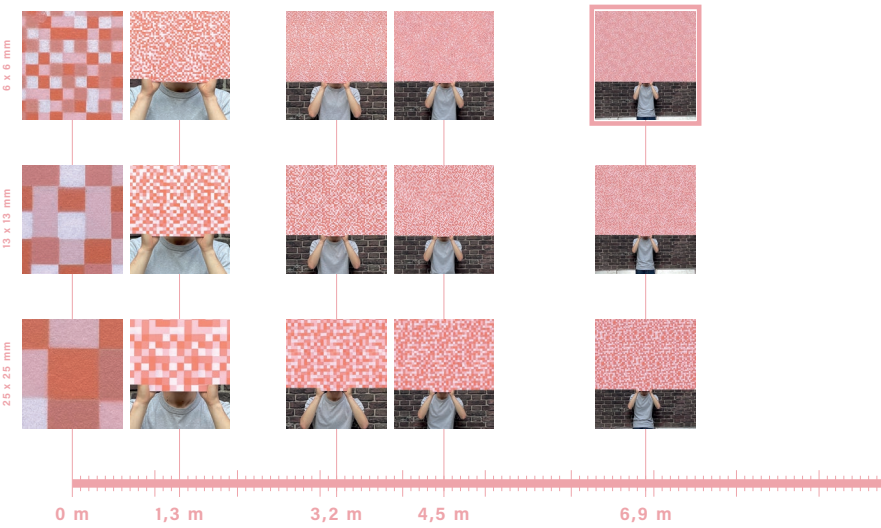
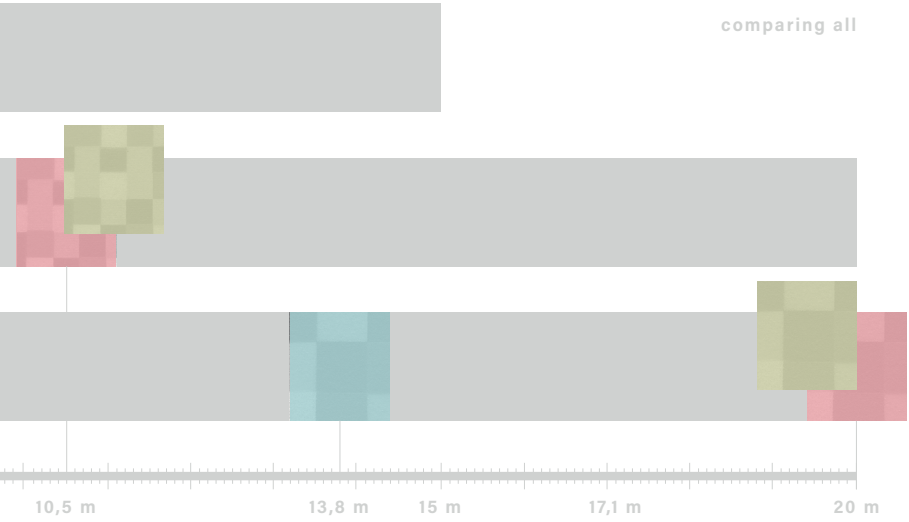
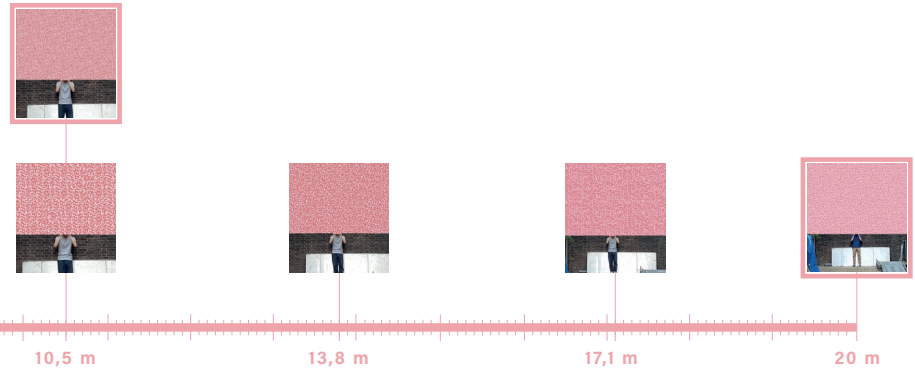


Figure 10: Colour pallet b, all sizes and their accompanying distances of blending. Own material.

comparing all



smaller scope of colours:
warm colours
3 different sizes



The bigger the range of colours in the pallet (a) the bigger the distance needs to be in order to just perceive the blended colour. So, using only blue tones (c) for the colour pallet makes the needed distance for the blended colour shorter. Nonetheless, this doesn't work for all colours. The four tones of red used in colour pallet b require the same distance to reach the blended colour as colour

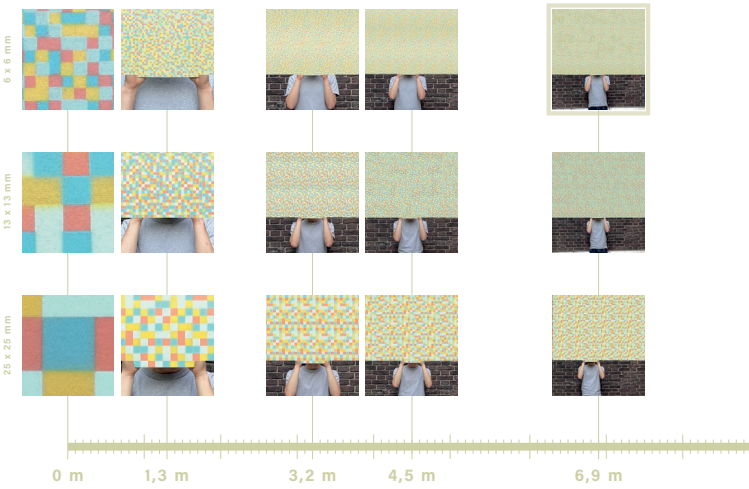


Figure 11: Colour pallet a, three sizes and their blending distances. Own material.

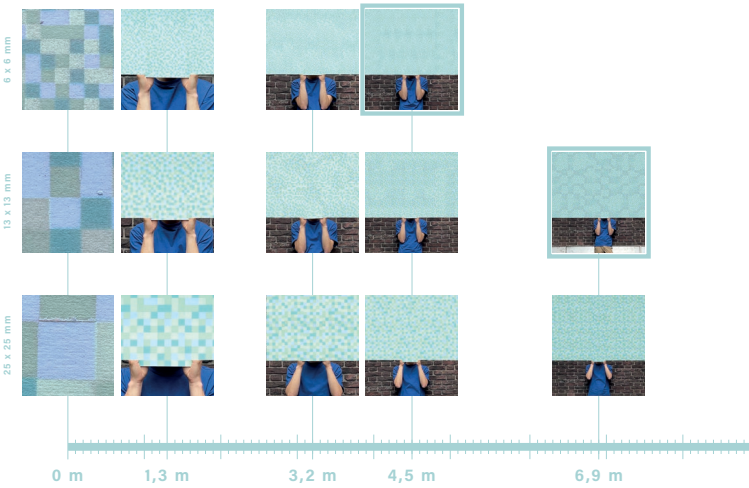
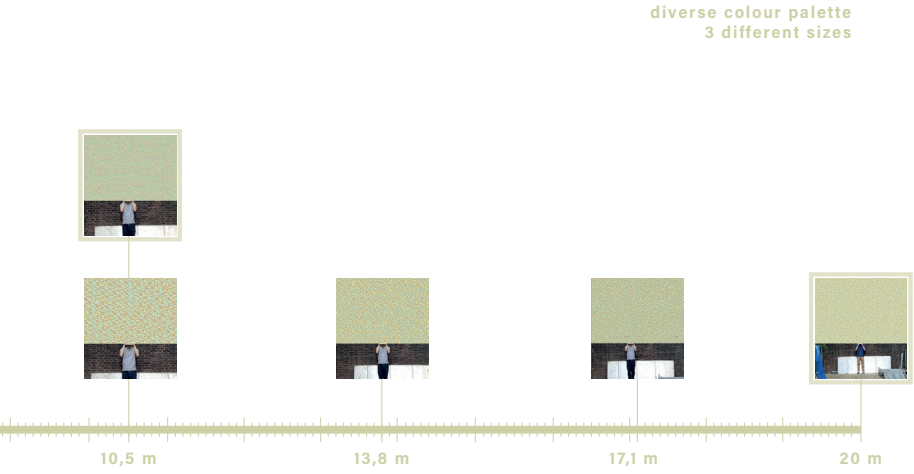
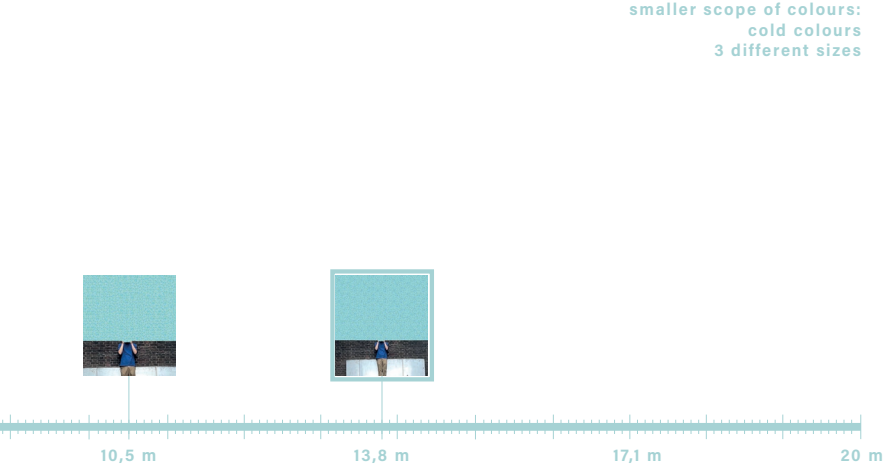


Figure 12: Colour pallet c, all sizes and their accompanying distances of blending. Own material.

pallet a. This is because the four used tones of red shows a bigger contrast between them compared the four used tones of blue in pallet c for example. When making the contrast between the four red tones smaller (by using just one colour in different opacities), it is indeed visible that the required distance to reach the blended colour is equal to the one of the blue toned colour pallet (c) (figure 11 & 12).





DEFINITION

Now that there's an understand of the main principles of the blending of pixels, it is time to go translate the idea of the pixel and see how else it could be used. This is done by finding interpretations of the principles of the pixel. A definition of the pixel is formulated, so that the search for interpretations is more targeted.

In this research, the small unit referred to as the pixel, has the following meaning (figure 13):

1. Each pixel is an individual element, but it is only visible as a pixel when it is among other pixels, so among other elements.

2. Even though these elements can be working harmoniously together, they should be able to be identified as individual items. In other words: in physical sense, the pixels cannot overlap.

3. The physical size of the elements has to be small enough in order to (optically) blend together at (human scale) distance.

In short:
1. Multiple elements
2. Individually identifiable
3. Small enough for blending at human scale distance

INTERPRETATION

Understanding what pointillism is, how it visually works and what defines a pixel provides the basis for interpreting the concept of the pixel as different kinds of systems; Changing the image of the pixel from the straightforward coloured squares to something more spatial, aesthetically, designed or based on coincidence. This level of translation is needed in order to find a system that is suited for the eventual object of application: architecture.

1. element pixels

2. physical overlap pixels

3. too big elements for blending

small enough for blending

Figure 13: Definition of pixel (right) vs. non pixel (left). Own material.

Having the definition of the pixel in mind, the interpretations of the pixel made can be divided into the categories of layers, textures, elements and single surfaced. The category of layers, makes use of perforated materials, each with its own colour, placed behind each other. Variables that influence the pointillism effect of this system are the distance between layers, the size of the openings, the width of the material in between two openings, the pattern of the openings, the last layer being closed or transparent and the colour of the front layer compared to the further layers. Figure 14 shows several options for this system. For full documentation of the testing process see appendix 6, pp 34-59.

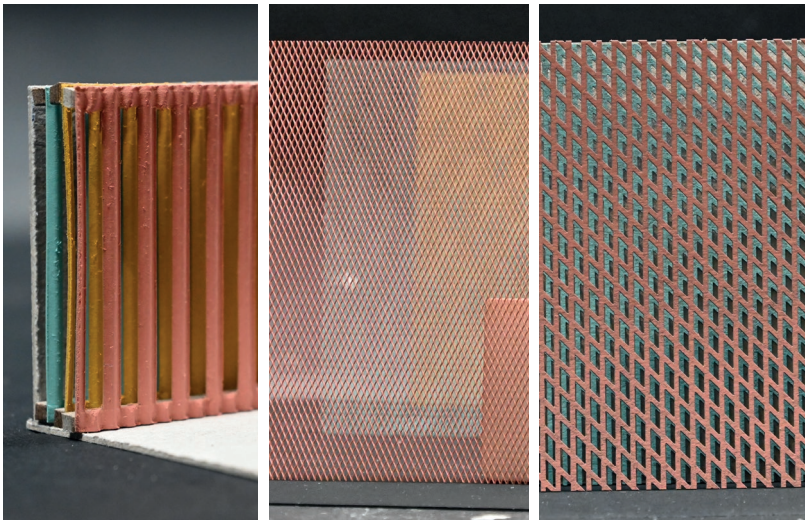


Figure 14: Interpretation tests of the system 'layers.' Own material.

This system of layers mostly depends on the movement of the observer along the surface to create the versatile experience of the colours, rather than the movement perpendicular to the surface (which would be the case during the approach towards that surface). Nonetheless, in case this system is applied on a surface as big as a façade, there is always an angle at which the observer sees through the meshes and experiences all colours.

The category texture, focuses on the effect of light creating bright and dark spots onto the surface because of the rough surface. The contrast between light and dark is then interpreted as different pixels (figure 15).

This system is less effective as expected and very depending on the light circumstances on site. It would be interesting to see how to develop this option further as a multicoloured version, but for now it doesn't fully provide the possibilities of achieving the depth 'goal' via pointillism as a method.

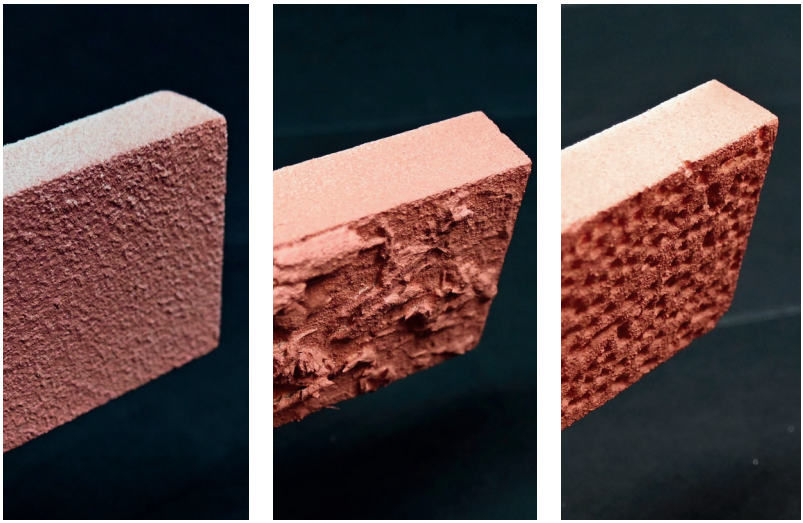


Figure 15: Interpretation tests of the system 'texture'. Own material

The third category, 'elements', is most alike to the systems used in the architectural projects of the last category of the project analysis booklet. Literal objects, all in their own colour and individual existence create together a composition. Variables for this system are the shape of the objects, the way of mounting them, the composition, the space in between the objects and which side of the object is coloured.

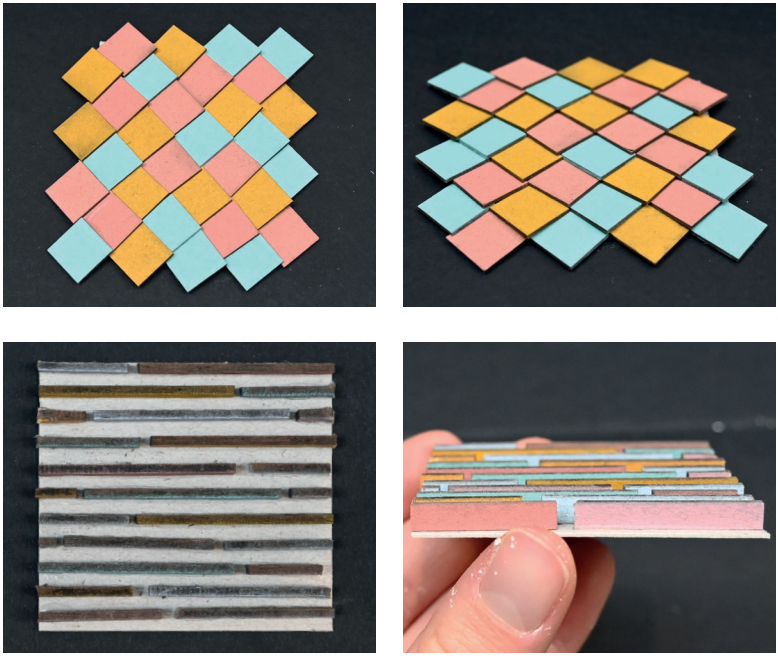


Figure 16: Interpretation tests of the system 'layers.' Own material.

The one test shows a composition of pixels that comes closest to the straightforward idea of a pixel (figure 16). It is easy to image these elements being ceramic elements, connected to a framework. These elements could also be hanging further apart, differently shaped or differently dimensioned. Even though it represents accurately the concept of the pixel as defined, all the small elements require a lot of labour to instal and maintain. Therefore, it is most likely to be an unrealistic option for a big-scale architectural project which is part of the framework of this research.

For the second test, the bars form a composition in which the colours are only visible from a specific angle and not yet when arriving (figure 16). It is because of this last fact that it fits more in the category of 'visual tricks' than in the category of direct visibility when approaching.

The last category, 'one surfaced', is the result of using the pixel concept, but making it less complicated or engineered as the first and third category. It is built up from a base (colour) with randomly applied pixels in different sizes (figure 17). The variables for this system are the colour of the base, the colour of the pixels, the size of the pixel and the density of the pixels.

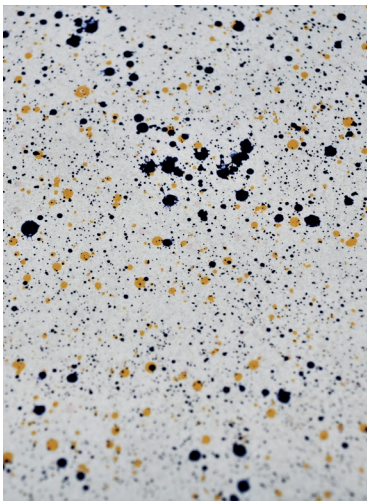


Figure 17: Interpretation tests of the system 'one surfaced'. Own material

BUILDING SCALE

Chapter 2

The categories 'textures' (2) and 'elements' (3) are eliminated for further steps because of their lower probability of achieving the goal of creating depth in colour within the framework of this research as explained in previous visual testing and analysis. That way it can be concluded that the categories 'layers' (1) and 'one surfaced' (4) show the most potential for achieving that same goal.

The visual tests show the principles of the systems in a close-up way; how they work in theory. Enlarged versions of them make it possible to see the systems as façade principles on a building scale. Both systems have multiple variables that can influence the effect of the pointillism method (as mentioned above). For the enlarged versions of them one set of variables is chosen as benchmark, based on the results of the testing so far. It is visible how the system 'layers' becomes a literal deep, but porous and airy façade system mounted with precision while the 'one surfaced' system provides more for massive properties and coincidental character (figure 18).

Figure 18: Enlarged models for systems 'layers' and 'one-surfaced'. Own material.

LAYERS SYSTEM

In the first photo series of the 'layers' system (figure 19), it is visible how different angles of approach create the visibility of different colours at the same time. Changing the angle, means experiencing a different colour composition. This shows that parallel movement to the building will provide a versatile experience of the building.

Nevertheless, the perpendicular movement to the building, shows how the system works as a pointillism concept. Increasing the distance between observer and the layered system, makes the colour of the second layer fades away while the front colour becomes more and more dominant (figure 20). Quickly, the front colour is all that is visible. Presumably, the presence of the colour

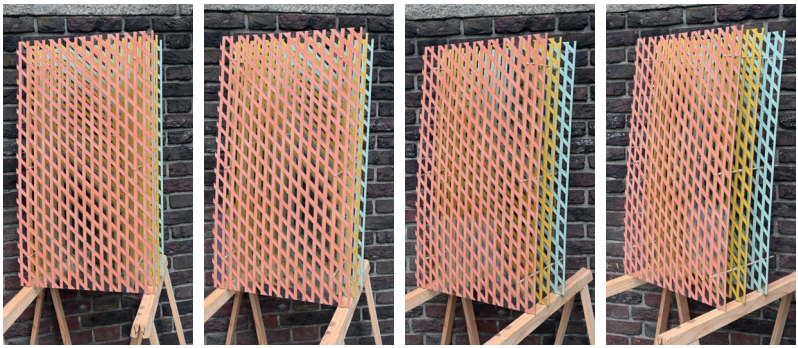


Figure 19: Parallel movement to the layered surface. Own material.

Figure 20: Perpendicuar movement to the layered surface. Own material.

of the second and third layer can be more emphasised by changing the width of the material per layer; The first layer would have the biggest openings and slimmest profiles and the second layer smaller openings and more visible material and so on for the third layer. This could make the blending of the colours more gradual. Further testing and searching for the right combination of variables, could get the ideal effect of pointillism in this layered system. However, this also shows how precise the different aspects of the system have to be coordinated and executed. This 'engineering' of the system goes against the goal of making the use of colour in architecture easier.

ONE SURFACED SYSTEM

The 'one-surfaced' system is in theory so alike to the very first principle tests of the pixel (appendix 3, pp. 12–17.) that it can be assumed that the concept of pointillism works with this system. Therefore the enlargement of this system focuses more on understanding the influence of the variables. As mentioned, the density of the pixels on the surface, the chosen colours of the pixels and the size of the pixels have an influence on how the pointillism principle works and how the colour will be experienced during the approach to the surface.

After testing the influence of the variables 'colours' and the 'density' of the pixels, three conclusions can be made:

- The needed distance for perceiving the blended colour gets longer as there is bigger contrast between pixel and base colour (see figure 21 & 22 and appendix 7, pp. 74-79.).

- The needed distance for perceiving the blended colour gets longer as the density of the pixels is higher (see figure 21 &22 and appendix 7, pp. 74-79.).

- None of the above is significant enough for the distances of approaching a building in an urban context when the size of the

pixel is not adjusted appropriately to such a context. In order words: when the pixels are too small (in this case <10mm), the pixels are not visible anymore from already a couple of meters away. This distance is much smaller than the distances between observer and building when arriving to a building (see appendix 7, pp. 74-79.).

Figure 21: Close up of pixel sheets. From left to right: dense and contrasting, dense and no contrasting, not dense and contrasting. Own material.

Figure 22: Point of blending per pixel sheet. From left to right: 6m, 3,5m, 3,5m. Own material.

Increasing the size of the pixels shows that indeed the pixels stay visible much longer while the distance increases. Therefore the influence of the pixel is significant for a longer part of the arrival to the surface. Eventually, when the colours do blend and the

individual pixels are not identifiable anymore it becomes clear that, with this density of pixels, the resulted (blended) colour is always an alteration of the base colour and not a combination of the used pixel colours. This shows the importance of the base colour on the full colour experience.

Figure 23: Scaled up pixel sheet, showing perpendicular movement from the surface. Own material.

SELECTED SYSTEM

Even though the system 'layers' asks for more testing in order to find the exact right combination of variables that create the pointillism concept which causes a versatile experience while approaching the building, it is credible that the system is capable of such. Therefore, both systems (layers and one-surfaced) show the potential for creating depth in the colour of exterior architecture and provide for a versatile experience of that colour.

The layers of wired mesh is an 'innovative' interpretation of the concept of a pixel, but requires quite some engineering to get the wished colour experience. The one-surfaced system has a 'what you see, is what you get' character, but seems less of a new discovery. Nonetheless, much is discovered regarding the variables of this last system and their influence on the final experience of colour. This

is why the one-surfaced system offers the best conclusion for this research in which it was the goal of finding a method of using colour in the exterior of architecture, well usable for architects during the design process.

Besides the findings in this research, the nature of design also plays a part in choosing which system is the best for the continuation of the process. In the case of the design that will follow from this research, it asks more for a solid-looking option. That way, the one-surfaced system fits better than the layers system.

MATERIAL

Designing with this system of colour use, the use of a composed material is needed. A base material that can hold smaller bits which will form the pixels, without the two materials mixing into each other. Examples can be terrazzo or any other composite in which stone or glass chips are pressed into a base layer (often concrete or epoxy). By deciding the amount, the kind and colours of the chips, it is possible to control the variables discussed above. A modern twist on this example could be recycled plastic. In this case, the base layer consists of small chips of plastic as well, but all of the same colour. The pixels are then the same kind of plastic chips, but all another

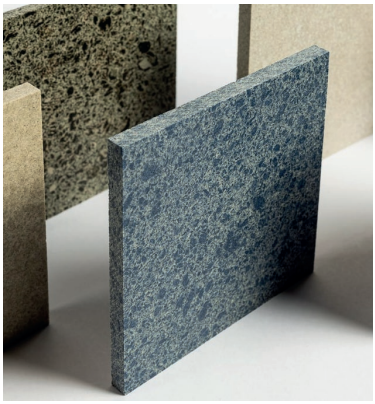


Figure 24 (left): Terrazzo 'Napels' sample. Studio Minéral (n.d.).

Figure 25 (right): Tiles made from fish scales. Scalite (n.d.).

colour. The same can be done with glass or any other rest product of the building industry, even though there is often a smaller variety in possible colours. Choosing which material to use for the design, depends of course on what the designer is aiming for. Among others, elements such as the structure of the building, the available sizes of the panels/tiles/blocks, the climate circumstances on site and possible non-straight shapes in the façade have an influence on the applicability of a material.

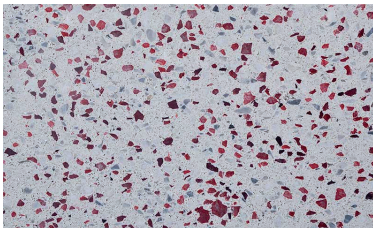


Figure 26 (left): Panels of recycled plastic, customized. Smile Plastics (n.d.).

Figure 27 (right): Concrete blocks with recycled glass bits in it. Westbrook Concrete Block (n.d.).

POINTILLISM AS COLOUR METHOD

Conclusion

When approaching a building, many building elements influence the experience of that building. One of them is the used colour. Unlike other building elements, colour is most often a coincidental side note instead of a thought-through decision. In the cases where colour is used, it is often too simplistic compared to the level of abstraction and detailing of the other design aspects. This is caused by a lack of knowledge on the topic among architects. Therefore, this project is an attempt to understand how colour in the exterior of buildings can influence and enhance the experience one has when approaching a building from far away towards the entrance. This is done by posing and answering the following project question: *"How can the used colour contribute to the versatile experience one has while approaching a building from far away towards the entrance?"*

This project question is answered by executing a research project and a following design project that answers the question of *how the design can provide for a sequential process of arrival. The research project, which results in this research paper, answers the following research question:*

"How can the painting technique of pointillism be translated into a way of using colour in the exterior of architecture?"

By analysing both painting methods and 50 colourful architecture projects, pointillism presents itself as a possible concept for contributing to such an experience. Pointillism creates depth in colour by creating different perceivable colours depending on the observers' distance to the object. The bigger the distance, the more the perceivable colours blends into one new colour (the 'blended colour'). The closer one gets, the more individual colours (pixels) one can see.

A pixel is in this research defined as:
- One of multiple elements
- Individually identifiable
- Small enough for blending at human scale distance

Interpreting this definition into an architectural application, shows four possible systems. Based on testing, the 'one-surfaced' system shows the highest potential for what this research (and future design) is aiming for. The 'one-surfaced' system is making use of a base colour, with coloured pixels inside. Variables for this system are the colour of the base, the contrast between the colours of the base and the pixels, the size of the pixels and the density of the pixels. The size of the pixels has to be appropriate for the scale of the building and surrounding, so that the blended colour appears at approximately 50 meters away from the building, not closer.

Based on the tested variables in this research, the blended colour seems to always be an alteration of the base colour, rather than a combination of the pixel colours. This illustrates how the base colour determines the biggest part of which colour is perceived while the added pixels provide that colour with its depth and cause an alteration. The properties of the pixel, such as density and the used colours, influence this alteration; The higher the density of the pixels, the bigger the influence of pixel colours on the alteration. The same applies to the chosen colours of the pixels compared to the colour of the base; the bigger the contrast between those two, the more influence the pixels have on the alteration of the base colour once all colours blend.

Yet, the exact colour to use in this method still has to be chosen, which illustrates exactly the goal of this research to give an example of how to use colour, not which colour. That is to say, this specific way of interpreting and using pointillism as a colour method for an architectural exterior is a solution, not the solution, for understanding better how to treat colour in exterior architecture and include it in the design process.

Figure 28: Two examples of colour, pixel size and density experiments for a future design proposal. Own material.

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