

Reflection Report P5 Presentation

A reflection on the gradation process and design

Reflection report by Roel Westrik - 4229908

Tutors: Henriette Bier
Sina Mostafavi
Ferry Adema

Abstract

The graduation project consists of a design inspired by Maurice Ravel's 'La Valse', as a direct translation from musical experience to an architectural experience, to provide the city of Vienna a common ground for young and old music scenes in the form of a public park/pavilion. Reflecting on the process of designing this park I found the use of computational tools to have helped me remain in control over large data sets, something that helped me gain clarity of the process and the design. I found the Hyperbody studio provided me with the tools and knowledge to remain in control of the design. Finding balance between giving the building social-economic value and designing from a musical point of view was, especially in the later parts of the design most difficult.

Keywords: algorithm, architecture, computational tools, design, ethical dilemmas, graduation project, music, research, scientific relevance, social relevance, Vienna

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Introduction

The goal of this reflection report is to look back at the graduation process, which started in February of 2018. As the project is nearing its completion it is time to reflect on the process and document my findings. To learn from an immense undertaking as this graduation project is of great importance. Never again, and never after this, will I work on a project with this level of intensity across all levels of design. Students work from the formulating first drafts of ideas to detailing the micro layers of the design. It is a unique opportunity to work this freely on a project of this scale, and the way we incorporate all that we have learned in our practice, will define us in the career that may lay ahead of us.

Below you will find firstly a brief introduction and description of my graduation design, as a requirement for participating in the P4 presentation, (you may also find it here:

<http://uf.roboticbuilding.eu/index.php/project07:Frontpage>), followed by a reflection on the graduation process.

Description Graduation Project

For centuries, Vienna has been the center of Western classical music. Even today the remnants of the musical vibrancy in the city can be found in the great music halls such as the Wiener Staatsoper and the Wiener Konzerthaus. However in recent decades a new movement to the East of the city can be found, where young artists have converted old buildings to music halls to provide up and musicians with an opportunity to share their music with a new audience. The goal of my project is to unite the two worlds by transforming an empty lot in the middle of both regions into a public park. The driving force behind the design of this park is inspired by Maurice Ravel's La Valse, a piece he wrote mourning the divided state of the music scene of Vienna in his time.

As part of the design, I want to translate the musical experience of La Valse into an architectural experience. For this, I designed an algorithm which could store the music as primitive data, so that throughout the entire process, I could easily reference any aspect of the music I wanted. I achieved this with the means of color, namely the HSL color space: HUE, SATURATION and LUMINATION. As I played La Valse myself on my digital piano, the data of each individual note consisted of: a time stamp, pitch and velocity (or volume). By remapping the twelve notes in the chromatic scale to the circle of fifths, we can store, for each individual note, its position to the HUE value of the HSL color space. By grouping together notes and measuring their distance to the center of the circle, we get the SATURATION for the HSL color space, which means the complexity of the music. Loudness can simply be mapped to the LUMINATION of the color space. By grouping together groups of notes, and averaging their color, we can find a diagram for all harmonic centers in the piece, which will be our main diagram for circulation. Volumes are placed in this diagram, with their sizes according to the loudness and length of the corresponding music. A relationship is established between volumes by moving particles through a vector field; where volumes have a strong (musical) connection, particles are moved around, if they have a weak connection, particles are moved in between them. After a stress analysis, a geometry wrapper is used to give mass to the path of each particle. Where the music is loud, each path will have a great offset, where the music is quiet the offset is smaller. This will create cavities in the geometry so that soundwaves will be trapped, meaning the building will get quieter as the music is quiet, and, due to reflections on smooth surfaces, louder as the music gets louder. A roof is designed for the park, by bundling the paths of the particles to allow for weight saving and controlling the way sunlight enters the park. Construction and materialization consists of concrete and milled EPS to allow for freedom of form and geometry.

Relationship Research and Design

The decision to translate music to architecture will always be a controversial one. It is a concept which is abstract in its nature as we are dealing with different styles of art. Even though many artists and philosophers have argued their common grounds, music and architecture both exist in different realms of art. As a consequence, the process of working within both realms will always be abstracted and subjective.

This can become an obstacle in a university level design and research studio. It is important that all parties involved have the same understanding within the process. That's why I decided to use computational tools as a basis for the project. Within each and every step of the research, we can discuss and analyze decisions I made on a grounded and fundamental level. We can reference every step of the process back to its origin in the music. In this way, we create a concrete set of data to work with instead of relying on abstracted matter. Instead of using personal influences that may influence the final design, we can trust that the design is in every aspect grounded in concrete matter, whether it be architectural or musical input.

We can say that instead of designing an object, we are designing the algorithm which gives shape to the object. This means that research and design are not, as opposed to most conventional architectural designs, cause and effect, but they are one and the same. As we design the algorithm, we design the object (which is the goal of any studio in the Architecture Track), and as we design the object we design the algorithm. We do not research as a basis for design, but we design our research as much as we would design our object.

Relationship Research to Hyperbody & the Architecture Track

With the decision to formulate music as a set of data comes the decision to design our building with the tools necessary to read and process this data. The Hyperbody studio provides the students with the knowledge and tools to understand this process. Computational tools will provide us with the means to work with large sets of data. One might think that we resign our power and control over the design to the computer, who will make all decisions regarding the design for us. However I have seen this to be untrue, and will argue that as we as designers remain in control of the algorithm, we remain in full control over the design. I would argue that this is the main philosophy of the studio and how the studio defines its position amongst other studios in the Architecture Track.

However, it is necessary to reflect on this in my own project. With all the power the computer gives us, it is easy to fall into the trap of letting go of control. The computer can help us generate unimaginable objects and images, but we must ensure that in architectural design, all decisions are based upon relevant data. The designer should always be sure not to be seduced by charming imagery. Design must always be substance over form, and I find the success of a design to lie in this very principle.

Scientific and Social Relevance

The success, or failure, of my design lies in the research it is based upon. The stronger the relationship between object and study is, the stronger the basis of the design will be. The main focus of the design, and hence, the research, was to make an abstracted translation concrete, insightful, and most of all: meaningful. It was difficult to pinpoint clear scientific and social uses in the process. Read more about this in the chapter 'Ethical Dilemmas'. However I have found 3 elements of the research and design which can be of great use for the studio, faculty, and scientific field.

First, the research and design deal with a great amount of data, all of which need to be processed in their own specific ways. The difficulty lies in how we handle the data sets and, more importantly, how we manage the interaction between data sets when they come together. This is something I had to learn by trial and error, and is the biggest reason the graduation project has had a semester extension, as the flow of data was not sufficiently streamlined around the time of P2, which took place around June of 2018. I hope future students of the studio and faculty can learn from my mistakes and make their projects more streamlined in earlier stages of the process. You can read more about my findings in my workshop report here: <http://uf.roboticbuilding.eu/index.php/project07:Diverse>

Secondly, I did not realize until later in the process that I missed a fundamental layer of relevance towards the city of Vienna in my project. While the idea of translating music into matter is an interesting topic of its own, it misses a great deal of scientific and social relevance. By deciding that my design should tackle the underlying issue of the division of music genres in Vienna, I managed to give my project a new layer of meaning. I don't start my presentations and descriptions of my project with the idea of translating music into architecture, but I start them with the issue I want to attempt to tackle in Vienna. This validates my project on a social level, and gives new input into the design besides the data that emerges from the music.

Lastly, my design has been greatly influenced by researches by artists such as Refik Anadol, who designed digital paintings based upon abstract data, such as brainwaves¹. He has also worked on light sculptures on the Walt Disney Concert Hall². Also, artists such as Stephen Malinowski have previously attempted to give new meaning to music by the use of color³. However, in my opinion, all these attempts, while fascinating by their own right, lacked in depth with musical regard. Most designs and installations are grounded in either extremely abstracted algorithms, where input and output have been dissociated to such a point that all meaning has been lost, or in algorithms that are so simplistic that it is difficult to find any value in the output at all. As a musician I have attempted to give both meaning and substance to my algorithm, which is based in music foremost, and can be used in a wide array of possibilities, from architectural design (that is: my graduation project), furniture design (think instruments that light up, or lamps which respond to music that is played in the room) to installations that can be used in festivals or venues.



Figure 1 and 2: recent works by Refik Anadol, incorporating large data sets to create abstract sculptures

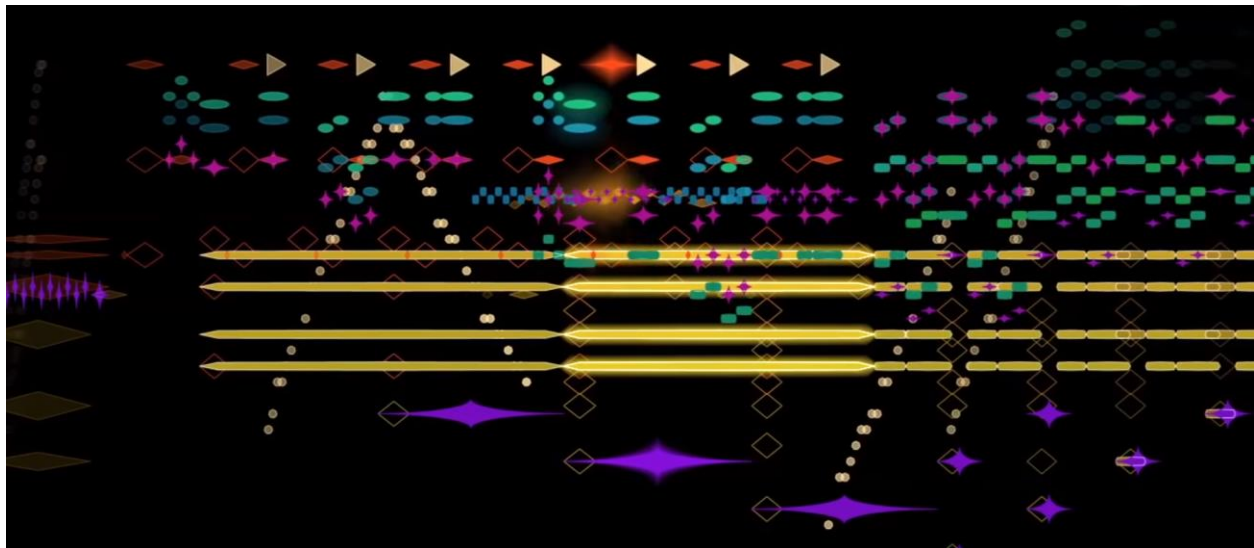


Figure 3: Music animation for Ravel's La Valse, by YouTube user smalin (Stephen Malinowski)

Ethical dilemmas

As mentioned before in this reflection, rather than designing an object, the main objective was designing a method of research, or algorithm. The consequence of this principle is a design which is informed by many layers of data, all cooperating to form one coherent object. However, there was a competitive nature in the data on the side of the musical input, and the architectural input. Ideally, one finds a way to distribute all data equally, each piece of information should find its rightful place in the final design. However, I was mostly inclined to prefer the data from the musical side, just to give my project validation of 'success', with regards to the translation of sounds into matter. However, in an architectural design which serves a societal function, perhaps mostly in its function to solve issues surrounding its location (in this case, Vienna), this may not be the right decision. Maybe a more righteous method would have been to always prioritize social relevance, production costs and economic and environmental durability of the design over what we might consider superficial ideas.

Final thoughts

In the end, we might wonder what would have happened if I chose a manual approach over the use of computational tools. Would the design have ended up very differently? Or would it in essence remain the same? I think that in the end the computational approach has led to an interesting design, and a research that lends itself to more than just this architectural design. I hope to continue working on my music and color theory after my graduation, to see what other opportunities lie ahead. All in all I think I have accomplished my vision of 1,5 years ago, as I have managed to bring together many layers of data to design a building, inspired by a musical source, that is durable and sustainable and serves a function within its socio-economic situation.

Sources:

Images:

1: Refik Anadol et al. (2018) Melting Memories. Accessed 10/05/2019 <http://refikanadol.com/works/melting-memories/>

2: Alexander Walter (2018) WDCH Dreams, renderings by Refik Anadol Studio. Accessed: 10/05/2019 <https://archinect.com/news/article/150086045/refik-anadol-to-cover-walt-disney-concert-hall-with-vivid-data-projections>

3: Stephen Malinowski (YouTube username: smalin) (2018) Title: Ravel, La Valse. Accessed: 10/05/2019 <https://www.youtube.com/watch?v=xh16-BU5f6s> : still from YouTube video, slightly cropped