Virtual Phenomenology

A Critical Essay about the Relationship between Virtual Environments and the Senses

immersive
virtual
phenomenology
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gustatory

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This article focuses on the content, process, and outcome of the design brief titled virtual phenomenology under the professional elective course DDFT 473 – Virtual Environments. The emphasis of the course tackled the relationship between the virtual realm and the senses using virtual reality HMD and controllers as tools allowing students the possibilities to create virtual spaces inside virtual reality. Students spent more than 50 hours inside the virtual void trying to correlate and ignite specific senses in relation to each created virtual space. Despite the tremendous researches related to immersive education, this article attempts to showcase the process and outcome within the framework of VR Sketch application and how the usage of VR technology affect and empower the creation of virtual spaces through the senses rather than focusing on a traditional 2D iterative method of creating architectural spaces.

Throughout history technologies have augmented human physical and mental capacities. Immersive technologies that include extended reality equipment (e.g., virtual reality and augmented reality head-mounted display) provide immersive three-dimensional virtual environment experiences that have greater impact than that of non-immersive tools (e.g., 2D computer monitor, mouse and keyboard). Inside immersive virtual environments, users can experience powerful emotions and feel psychologically as if they were present in these environments (Adams, 2004; Blascovich & Bailenson, 2005).

In an experiment done on students in immersive VR or via a self-directed PowerPoint slide show, the results showed that students reported lower motivation, interest, and engagement ratings when viewed in non-immersive way (Parong, J., & Mayer, R. E., 2018). In addition, virtual reality has enhanced students' learning experiences by providing them with a highly interactive simulated virtual environment (Kung Wong Lau & Pui Yuen Lee, 2012). The consensus obtained from many researches done on the use of virtual reality in learning environments demonstrates the positive impact of this technology on the ability of learners to solve problems, discover new concepts, increase motivation, and offer a high level of interactivity among others (Geris, A., & Ozdener, N., 2020). This paper will discuss the relationship between the virtual realm and the senses using virtual reality HMD and controllers as tools to allow students the possibilities to create virtual spaces inside virtual reality. Then it will focus on the selected process and outcome that specifically highlights the sense of taste and how students attempted to manifest a virtual gustatory space inside virtual reality. The paper will discuss how design process and outcome has allowed for both a final virtual space which stimulated the senses when experienced and the use of VR as a tool to design a space that is empowered by a specific sense.

VIRTUAL PHENOMENOLOGY

The utilization of immersive technologies has provided the opportunity to experiment with many existing theories and bringing them to the virtual realm; many of these studies tackled different topics such as the study on the feasibility and benefits of using immersive virtual environments where presence level was higher in the IVE compared to the still images experiment (Birenboim, A., et al., 2019). Another work specific to the usage of VR in higher education showed that the interest in immersive VR technologies for educational purposes seems to be quite high (Radianti. J., et al., 2022).

While many papers and articles have tackled the notion of phenomenology in their studies, a lot less included the impact of immersive technologies on such notion due to the fact that advancements in these tools are recent. Daniel O'Shiel in his book the phenomenology of virtual technology has dedicated a chapter where he writes on the changed selves and the values in VR, AR and MR technologies (O'Shiel, D., 2022). At the School of Architecture, Art, and Design of the American University in Dubai, the Center for Research, Innovation, and Design (CRID) is well equipped with state-of-the-art immersive technologies, hardware, and software that provided the students the opportunity to experiment and explore such a notion. Certainly, the sense of presence in a virtual classroom (Fig. 1, where each green capsule is representing one student) required a physical presence (Fig. 2, where each student is using a VR HMD in order to control the green avatar inside the virtual classroom) in a space that can allow students the 6 degrees of freedom where they can design any form, shape and space out of the thin air. The application used to make that collaboration plausible is done by VR Sketch, that is a plugin of SketchUp. The software allows for both individual engagement and design for a single user or a collective one for multiple users. It also allows a direct connection between the SketchUp file and the work that is being created in VR Sketch. In addition, it provides a clear, simple, and efficient way to design accurately architectural spaces with a friendly user experiences characteristics that are not present in other software. One of the design briefs of the "DDFT 473 – Virtual Environments" course titled "Virtual Phenomenology: Five senses Five Spaces" requested students to create virtual architectural spaces that can celebrate the human experiences and challenged them to connect these experiences with the human sense perception. In addition, the brief not only highlighted the importance of taking into consideration the philosophy of phenomenology but also added the significance of how to reflect it virtually and related to the virtual space.

The brief emphasized that students must connect three out of five senses in a sequential manner dedicating one sense per each space to be created, designed, built, and explored inside virtual reality for virtual reality experiences. It was mandatory for students to spend more than 50 hours inside virtual reality in order to accomplish this task throughout the three-and-a-half-month-long semester. Many students find it more challenging to correlate virtual spaces with specific senses; for example, the sense of hearing (Fig. 3) in contrast to the sense of touching (Fig. 4) and the sense of smelling in contrast to the sense of seeing. One of the students described her

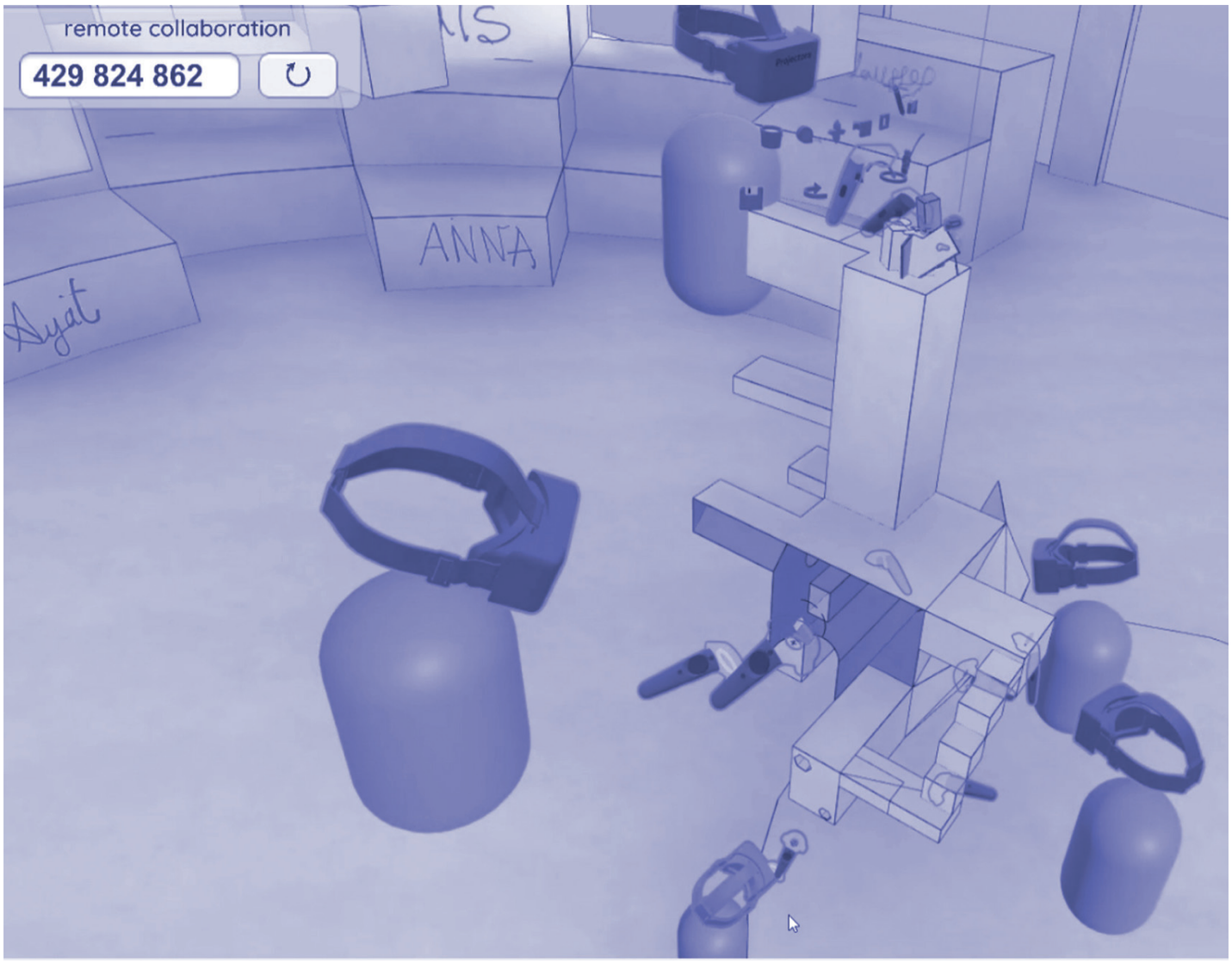


Fig. 1.

Fig. 2.

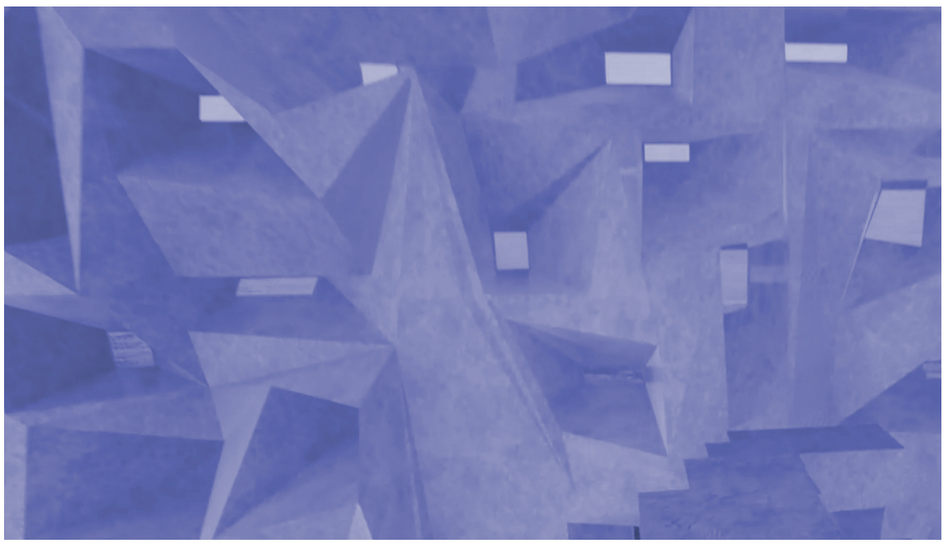


Fig. 3.

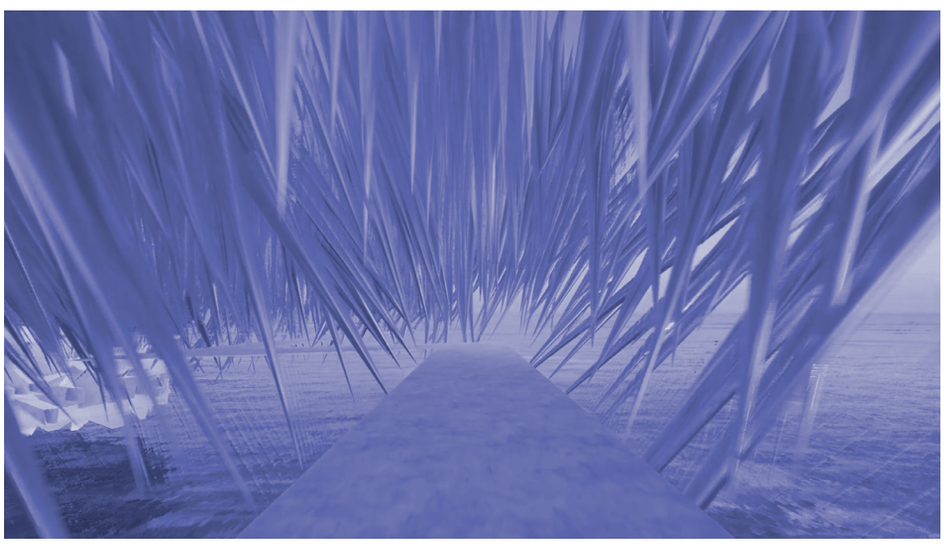


Fig.4.

project as follows: “A journey of non-traditional exploration of the senses into an abstract linear space that paves the way for the user through the soulless world around.” The goal was to identify what would ignite a certain sense and try to create an architectural virtual space that stimulate and reflect that specific sense. It was also important to engage the sense not only in the design outcome (Fig. 5) but also in the design process (Fig. 6).

VIRTUAL ITERATIONS

The students were asked to not only use virtual reality as a mean to navigate a 3D model that was built in a traditional 2D method, rather they were asked to immerse themselves in the virtual void and try to come up with iterations of their spaces in relations to their senses while being inside virtual reality. Accordingly, multiple methods were applied and students experimented in different ways to reach the desired outcome; Some students reverted to traditional 2D methods where they have uploaded a 2D sketch done by hand into the virtual void (Fig. 7). Some have used a 2D image that threshold, they felt less restricted

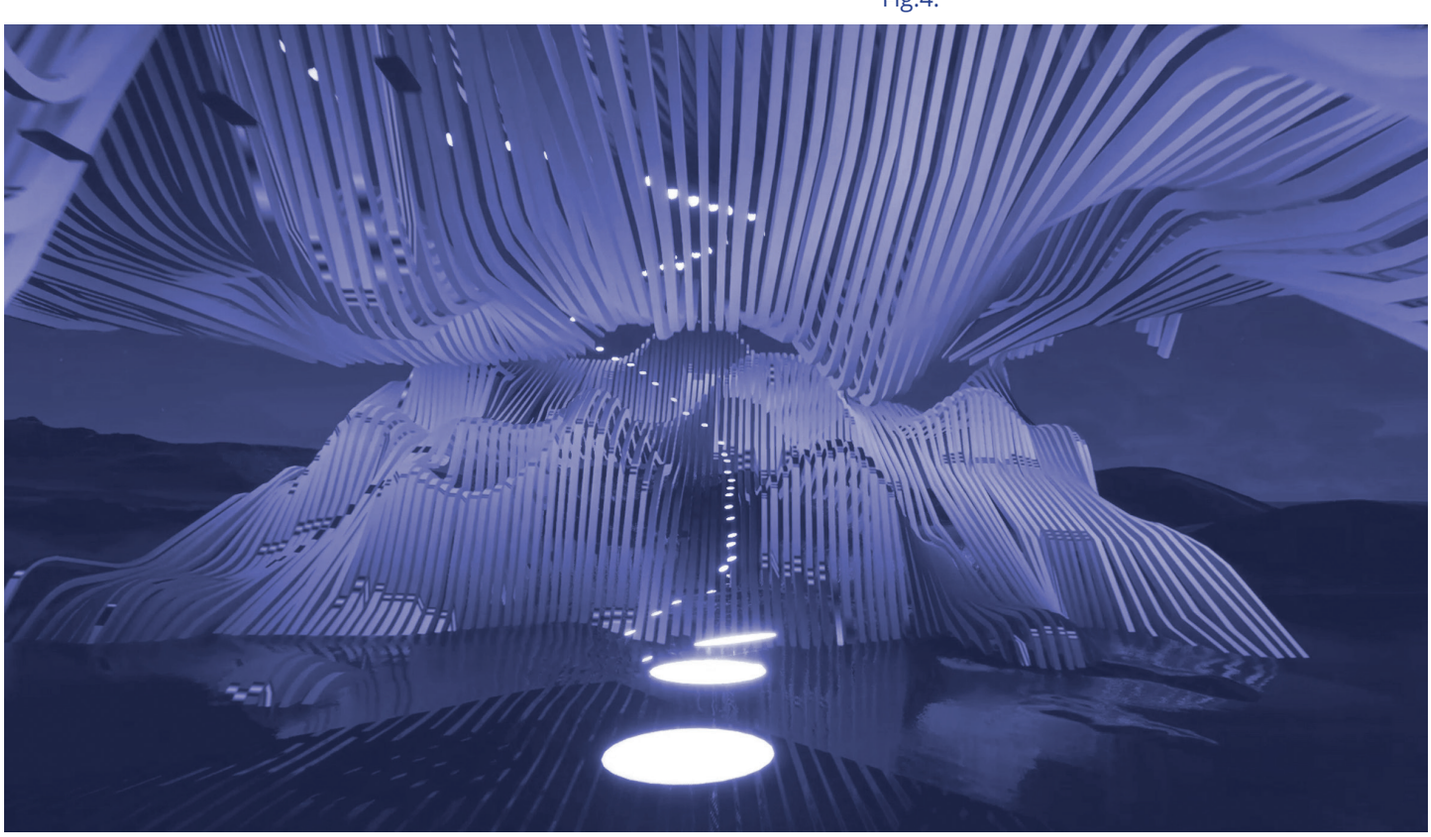
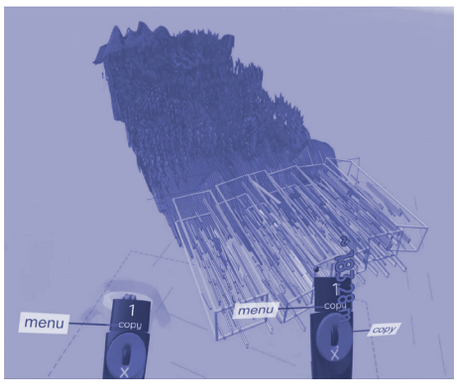


Fig. 5.



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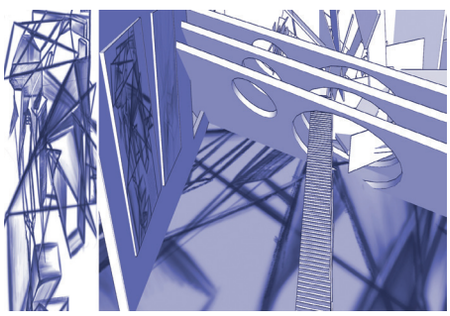

Fig. 7.

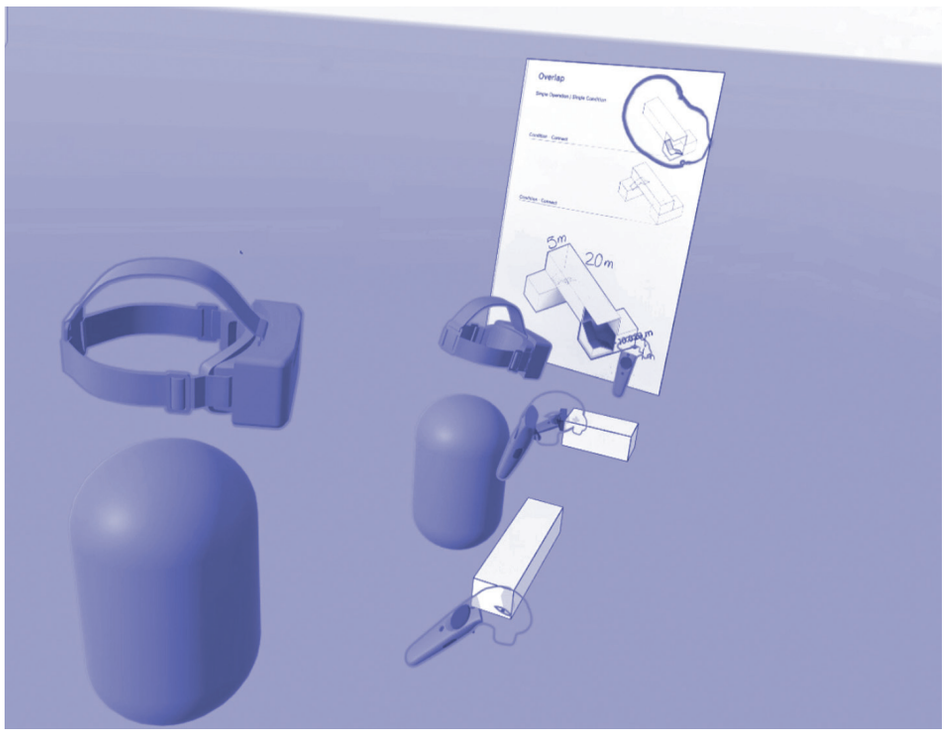

Fig. 8.

when designing in VR than on 2D flat surface or screen. This may be due to the connection between the immersive virtual environment and the capacity of the student to manipulate them and to manage the created objects with their hands using the VR controllers as seen in the images below.

TASTING THE VIRTUAL

Juhani Pallasma in his Eyes of the Skin, writes about how visual experiences can be transferred to taste, and the impact of certain colours and subtle details in evoking oral sensations. He continued elaborating upon the interior sensation of the mouth being the starting point of the human sensory experience of the world (Pallasma, J., 2012). There is no doubt that human senses are the medium - and perhaps one directly inside the virtual void as an inspiration or a way to build a 3D model based on information

Fig. 9-13.

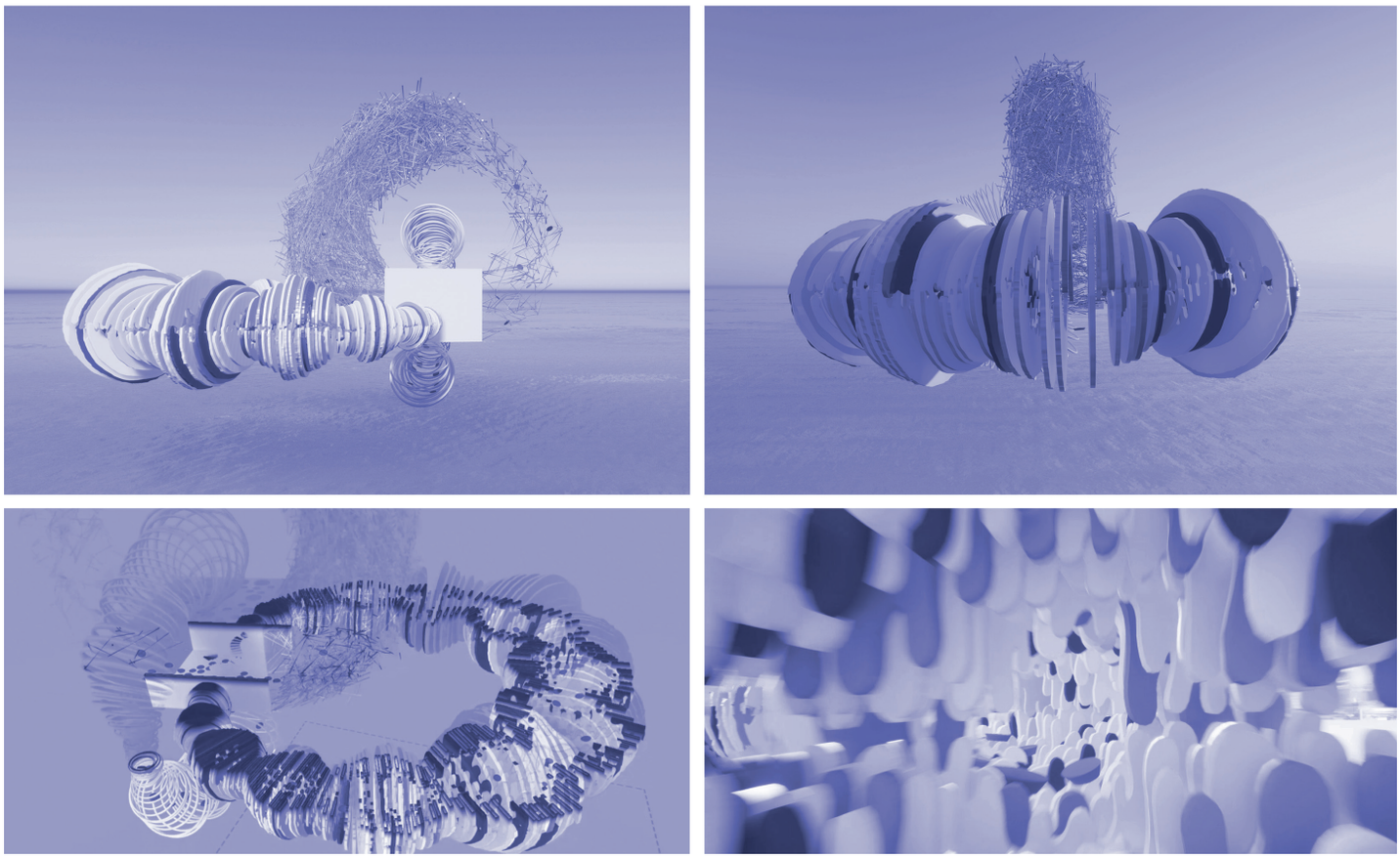

Fig. 14-17.

drawn on an existing 2D surface (Fig. 8).

Many students tried to build their spaces directly in 3D inside the virtual void and attempted to argue that they are - the tools by which architectural spaces are experienced, and through that, textures, materials, and colours play an important role in the way space is perceived and explored.

Across the board, all students were challenged to materialize the virtual spaces that manifested the sense of tasting. They argued that creating a virtual space triggering the sense of taste is more difficult than creating a physical one because in the virtual realm one can only stimulate the sense of vision rather than the other senses that usually play a significant role in experience, specifically the olfactory and haptic sense.

In the project named “Virtuality” the student explained that in the space dedicated to the sense of taste, she played around with the idea of melting food that apply iterations and overlap them directly in 3D (Fig. 9 -13). The majority of the students have expressed that it took them less than 10 hours inside VR to feel confident working and manoeuvring virtual environments. However, they mentioned that once they passed corresponded to melting ice cream (Fig. 14 - 17). The use of a light colour palette depicted different flavours, and the space was made of multiple spheres forming a wormhole like loop around the central passage. As one goes through those spheres, one finds that they get further and bigger towards the middle, and get closer and smaller at both the beginnings and ends. In another project called “Re-Birth”, the student explained that the exploration of this new virtual world is similar to a baby trying to experience the real world through the five senses. For her, technology is inspired by the human anatomy from cells to wires and everything in between, and accordingly, VR can allow for a deeper connection and creation of impossible spaces that relate to the senses. With specific reference to the space of taste, she elaborated that being surrounded by elements of different shapes, sizes, and colours, can stimulate the gustatory system and make one fully indulge in a state of relish. The pathway around the colourful candy-like shapes (Fig. 18 - 21) provides an immersive experience with a virtual sensibility for each taste and the multi-coloured confetti-like explosion acts as a finale to the overall experience and ensures leaving the virtual space on a “sweet” note.

While the experiences of spaces were made by the creators of the designs, there was a need to conduct peer review and feedback where students have accessed each other’s designs in an immersive way to provide insight on the feelings that they are experiencing and whether these feelings validate the intention of the creators.

CONCLUSION AND FUTURE DIRECTIONS

While the interface of a specific application can empower the human computer interaction, immersive technologies in general, and VR specifically, can provide a much more engaging experience due to its power to completely surround the users and separate them from the physical world. In line with the design brief that highlighted the human senses with the creation of spaces, VR has provided the possibilities for students to design virtual spaces that managed to put them in direct contact with their senses and by that informed them about the creation of these spaces. And even if human senses are overwhelmed by visual inputs, and some spatial expressions of senses were more challenging than others, students have managed to master the tool at hand and then use multiple traditional and non-traditional methods to accomplish the task. Another important observation on the process and outcome of this work, is that the majority of students felt more creative and engaged when designing inside virtual reality compared to its non-immersive counterpart, such as traditional 2D papers and computer screens.

There are tremendous opportunities in how human senses can inform and be informed by immersive technologies for design purposes. The power of VR is that it can engage the user more than any other non-immersive tools, and while other haptic technologies can be incorporated in such experiences, it will still need the proper design application that allow such interactions. As this is being written, there are currently some HMD that are capable of perceiving and giving feedback on human hand gestures rather than the usage of hand controllers. These advancements will for sure have their impact on how the future of immersive designs will unfold, and by that providing further intuitive and perhaps organic corporeal interaction between the human senses and the designed spaces.

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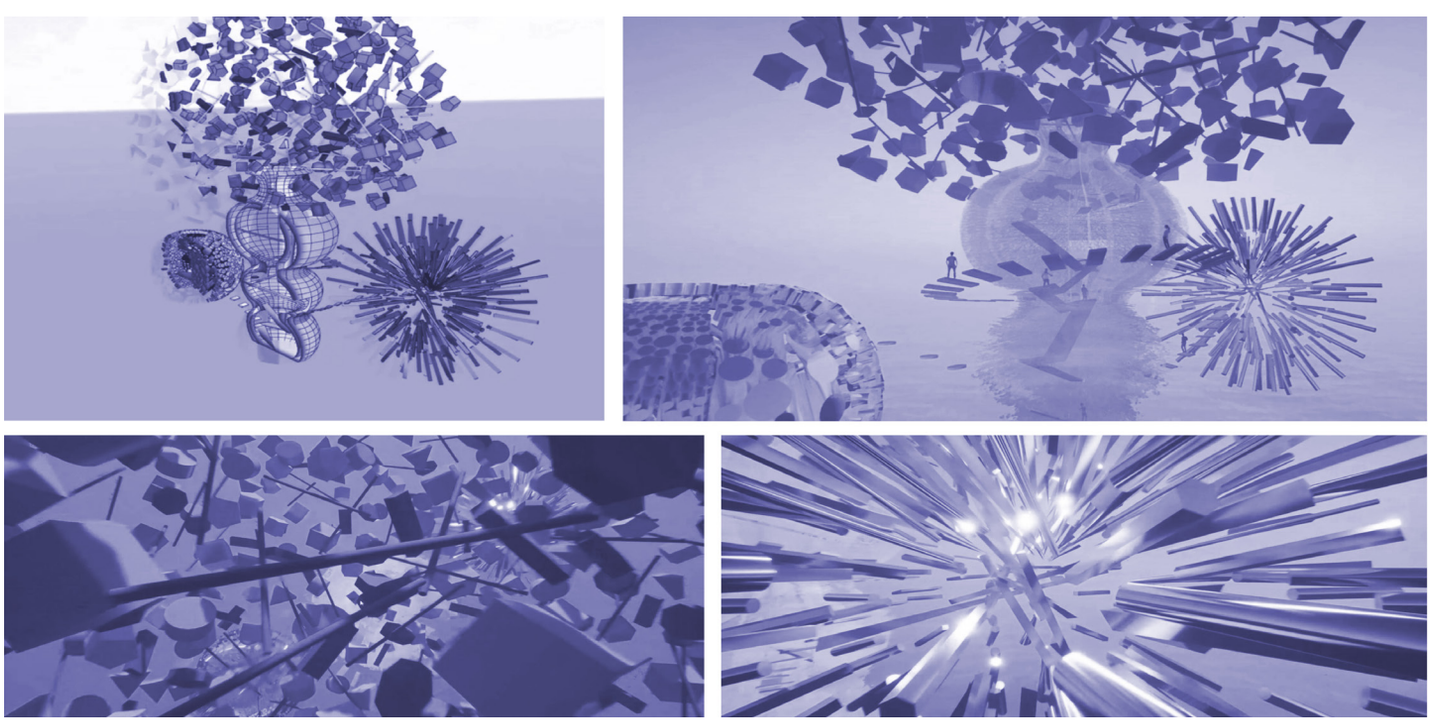

Fig. 18-21.