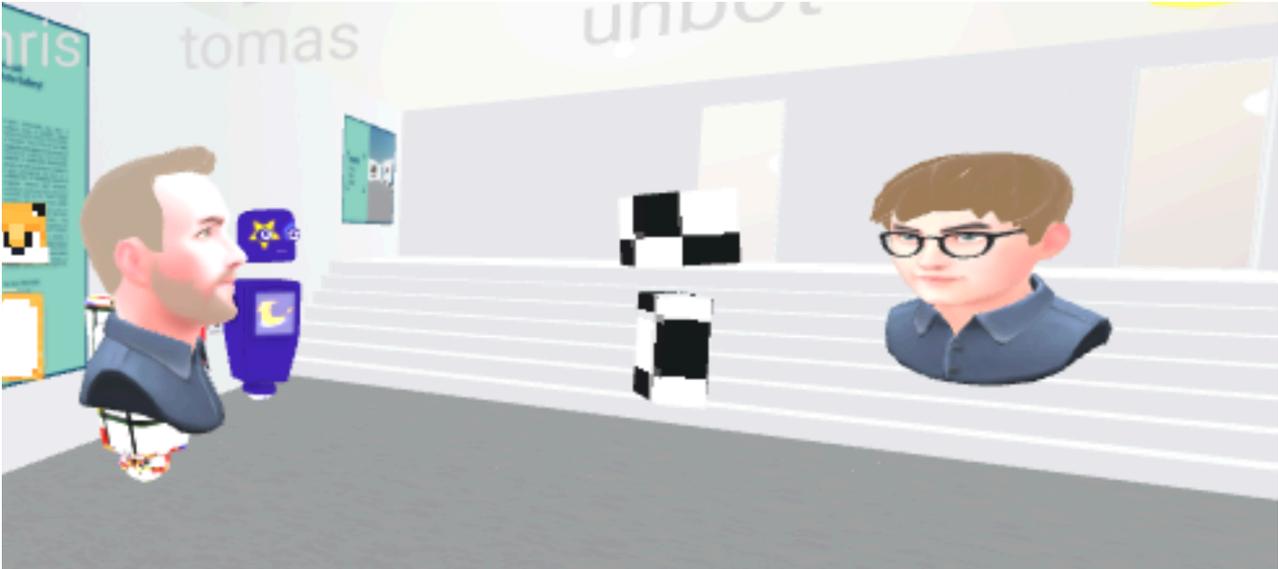# Postmortem:
The real virtual DIGAREC In-Game Photo Gallery

Overview: What is the Gallery?

Throughout the summer of 2020, the **"real virtual DIGAREC In-Game Photo Gallery"** was developed to present in-game photographic works created by students of the European media studies programme at University Potsdam/FH Potsdam in a virtual gallery. At the end of the summer term in July, the gallery was officially opened with an opening event, that made it possible for visitors to enter the gallery with an avatar or watch it as a stream on Twitch. It can now also be rewatched here:

The gallery was created using the open-source tools Mozilla Hubs and Mozilla Spoke, the first providing the platform for entering the gallery and using it as a social space, whereas the latter was needed to design the gallery space with 3-D tools. It was designed by Lars Pinkwart and curated by Sebastian Möring. The sound experience was created by Fritz Schlüter.

Artworks by:
Aaron Richmond, Alexandra Günther, Barış Aydınlı, Celine Pilch, Christine Laqua, Daniel Latzel, David Gatidis, Dulguun Shirchinbal, Elise Kunze, Emily Hadrich, Fabian Brandtner, Finn Wittforth, Friederike Sophie Schulz, Hendrik Fischer, Jasmin Lehmann, Karoline Mushak, Laura Willikonsky, Lennart Mackies, Lisa Hein, Luzie Müller, Marian Billing, Marie-Lena Höftmann, Maurice Matthieu, Nadja Scherfy, Oliver Thurau, Philipp Röbke, Pia Zdila, Sandra Buttress, Sarah Töteberg, Stefanie Löbel, Till Schöneich, Ugur Yildirim.

Aim and Motivation

Multiple events led us to explore the creation of a digital gallery for the in-game photographic works created by students. For a few years there had already been a virtual exhibition that was developed in Blender, but was only accessible when installed locally and did not allow the inclusion of any social elements. It featured student works from 2016 and 2018, while the new gallery space was extended with new student works from the last winter term.

The Pandemic

Due to the ongoing pandemic, with tools such as Mozilla Hubs became increasingly relevant, it seemed only logical to explore how to expand this idea of a digital gallery into a social space - one that could be used as a gallery, but also as a space for events, gatherings or other kinds of social interactions. When we started to explore these options at the end of May, we looked at it as an experiment whose outcome was still uncertain. However, as we started to see the potential of both Mozilla Hubs and Spoke, it became clear that we wanted to build a space that could aim at reproducing a museum and its dynamics in a virtual space, putting the artworks front and center. Additionally, it was important to build a space that could be extended in the future, as new student works are made.

While working with Mozilla Hubs some interesting advantages of a virtual gallery became apparent: There is a game character to the experience, it returns the in-game photographic works to their original medium, and most importantly it furthers international participation.

A Game-like Experience

Not only did the simulated space of the exhibition mirror the simulated images that were captured in these photographic works, the exhibition very much had a game experience to it. During the opening for example, the possibility of "wild creation" - of having visitors leave their own 3-d objects in the gallery, paint or write on the walls as well as react with emojis opened new interactive possibilities for a space that is traditionally defined by silence and individual observation. Another element that was more accidental than planned were the Easter eggs that could be discovered in the exhibition. More broadly speaking, the process of exploring the gallery was a familiar experience for anyone who has ever played a first-person game before, insofar as navigating a virtual avatar with the traditional WASD keys is essential for entering a Mozilla Hubs space. Even a customization of the avatar is possible, as well as interacting with, changing and exploring a simulated space. This arguably added a new layer to the presentation of in-game photography in a space that mirrors a game experience.

Back to the screen

In our current situation where computer screens are more than ever our only "window" to the world outside and central to our every-day experience, exploring a virtual gallery can be frustrating, only reminding us of what we are missing - a physical space - while pinning us to the screen once again. Often, concepts for virtual exhibitions have faced the criticism, that what is most central to an art exhibition - "encountering the real thing"[1] - cannot be fullfilled by digital replicas. So what if the "real thing" itself is a digital creation, an array of pixels, a capture of a screen? In fact, exhibiting in-game

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[1] Lester, Peter: Is the virtual exhibition the natural successor to the physical?, Journal of the Society of Archivists, 27:1, 85-101, DOI: 10.1080/00039810600691304

photography in a physical form in a traditional gallery space would always introduce a new layer of intention on behalf of the curators. Instead, a virtual gallery only brings back in-game photographic works to their original medium: The screen.

Accessibility and International participation

While planning the gallery and how to present it to "the world", we realized that this form of event would not only improve accessibility for local students, who of course are still quite isolated under current corona-conditions, it would also open up new possibilities for international participation. The accessibility of the exhibition also reduced the "barrier of entry" - not only logistically, but also in the general sense of a low-effort participation. Of course, platforms like Mozilla Hubs impose new forms of accessibility issues and limitations by requiring an at least moderately powered computer or smartphone as well as a fast internet connection. These issues were very present throughout the summer term in all academic settings. However, the general idea of opening a link to enter a virtual space of some kind, has certainly become common through the summer term and the formation of new habits. With art and event spaces introducing alternative programming for online formats since the start of the pandemic, virtual meet-ups, talks and even spaces have become a familiar experience, so there was always a risk of it being another drop in a bucket of water, especially in an international setting. Still, as the participation in the opening event showed, these kinds of formats really change the way international participation in local formats can be realized, and a bigger acceptance of these kind of events has certainly helped that.

Real virtual?

The concept of digital dualism - the idea of a sharp distinctions between the real and the virtual world, between offline and online - has been critiqued from many angles, with the sociologist Nathan Jurgensson noting that the false distinction and separation between the two erases the material and very "real" effects of what we experience. Yet, there remains a gap between "real" and "virtual" experiences - a liminality, a set of boundaries that distinct the virtual space. Still, as Bollmer writes, "We must always begin by assuming that all practices are material and real. (...) At the same time, the distinctions we make - online or offline, fictional and real - are not merely errors. Rather, they mark boundaries that matter."[2] The name of the exhibition is a play on this long-standing debate around digital dualism, which certainly gains new weight during this pandemic.

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2 Bollmer, Grant: Theorizing Digital Cultures, p.33, SAGE Publications

Realization and Execution - Building with Mozilla Spoke

Mozilla Spoke is a 3D-building tool that runs in a browser and allows users to build individual spaces for hubs. While it is more limited in regards to textures, materials and lightings than other locally installed 3D-building tools such as Blender, all basic functionality is included. Additionally, Spoke is very accessible compared to other 3D tools, not only requiring hardware that is moderately powerful, but also having a reduced and simple user interface.

What can be done in Spoke?
First of all, Spoke allows the creation of an architecture of a room or a space. Pre-rendered wall, floor and ceiling units can be combined to create complete rooms. These can then be further stylized by adding columns, stairs and other details to your space. These pre-rendered components are part of the Architecture Kit, which includes more than 400 different elements. Each of these elements can be styled with different textures and materials, although most of them have a dated feel to them.

Then, lighting can be added, although it is important to remember that these dynamic light sources take up a lot of resources. In general, light and atmosphere of a space are defined by the settings taken in the Skybox, which allow you to control the position of the sun and the time of day. Depending on whether it is night, day or sunset, the colors and light of your scene will change. Additionally, artificial lights can be introduced to highlight your scene.

Finally it is time to fill the space with what you intend to use it for, in our case it was time for the artworks. Images, Links, Videos and 3D elements can all be placed in the space.
There are two big library's of pre-made 3D content available directly in Spoke, which are Google Poly as well as Sketchfab. These can be used in your space as decoration or functional elements. It is important to remember that all media that is presented in the space has to be pasted into Spoke through a link, so pictures and videos need to be stored on the internet and accessible through a link. There is no "upload" function itself in Spoke. Images can also be used as material, to customize wall colors, implement branding or other visual elements, and 360° spherical images can be implemented to create 3D surroundings from a photo.

Limits of Spoke
There are a few things to keep in mind in regards to using Spoke to build your Mozilla Hubs environments. For one, while the accessibility through the browser means that it does not require a lot of hardware capability or a specific platform, it also means that editing requires a constant and moderately fast connection. Additionally, it is not possible to download Spoke files and open them in Blender or other 3D tools. This could be an issue further along, when there is a need to extend the space beyond Spoke's capabilities. Finally, as noted before, the selection of textures, materials and lightings is quite limited, which means that a polished visual impression is not easy to achieve. There is also the issue of embedded video files that stop to load after a few days, although this is likely caused by YouTube's embed functionality. Overall however, these limits are mostly a side effect of Spoke's simplicity.

The Opening Event

To present the Gallery to interested scholars and students, we decided to celebrate its opening in form of an online event. This event took place in Mozilla Hubs, with people entering the exhibition space through an avatar, while we also used Twitch to stream the opening. The Twitch stream had some advantages: for one, people without access to the hardware and software required by Hubs could still watch the Opening. It also allowed us to keep the amount of people in the space below the recommended twenty-five users. It also made it possible to keep a recording of the opening and make it available afterwards.

The Opening was planned around a small welcome at the beginning with a longer tour around the space offered afterwards. Visitors could follow the tour by moving around in the space towards the speaker. Then, individual artworks were discussed. However, in order to keep the event at an appropriate length, not all pieces could be discussed. Visitors were able to use Emojis to react and interact with the speaker, or leave a comment in the chat. After the tour, there was a short round of questions or comments, and visitors were free to stay in the space as long as they wanted.

To organize the event, we thought of adding a second interactive capability to the space by opening up a virtual pad, where visitors could leave impressions, questions and comments on the Gallery space. This seemed useful at first, because chat capability in Hubs is very limited, with comments disappearing quickly. However, during the opening it became clear that another opening an other window and interacting with it was overwhelming to most visitors, as the integrated chat function was quicker and more accessible.

All in all, the opening event was successful in bringing people to the gallery space and allowing the social interactions that make Mozilla Hubs and this project special. While some organisational and technical issues occurred, which were expected because of the fact that there could not be a "test" opening, the general experience seemed to be positive. Because the tour around the space was mostly narrated by one person, the capacities of Mozilla Hubs and a virtual gallery became only visible in the Q&A afterwards, where users could interact with each other and even create new objects and add them to the scene. It would be interesting to explore how this experimentation could be furthered in the future.

Best Practice advice

Remain aware of the technical limits of the software - only a limited amount of people can be in the space, and it is necessary to think about file sizes and the amount of data in the space before planning it.
One way to reduce loading times and improve the experience for low-powered devices is to divide the space into multiple hub rooms. These can be connected in Spoke so that it is easy to "hop" from one into the next. Especially when working on a fairly high-powered device, it is important to remember and to test on other kinds of devices.

Take time to test - or just figure it out as you go.
Certainly, thoroughly testing the space is very important. It is important to remember what your goal with these spaces is, and focus on how to achieve that central goal, especially in times like these in which experimental concepts are more likely to be accepted.

Think about the audio experience - make your space a sensory experience.
One important detail that we approached at the last minute was adding and controlling audio in the space. We first came across this issue when we wanted to implement multiple auto-playing videos in the gallery, whose sound started to overlap and extend through the whole gallery space. Spoke offers tools to restrict sound to a certain radius only. Entering a space that is completely silent is alienating: It furthers the impression that we are alone, and that we are not in the space, but looking silently upon it. Thankfully, we were able to implement an atmosphere audio created by Fritz Schlüter which was also used in our old, locally-installed digital exhibition. It improved the experience significantly: Not only was it clear now when you were entering the space (I had it open too many times in some tab without realizing it), it also reduced the alienating feeling of walking through a completely silent room.

Too far away? Presenting in the space also becomes a question of audio, as one of the main advantages of Mozilla Hubs is that it adjusts the volume of a speaking avatar depending on how close one is to it. Yet is important to make this clear from the beginning, in order to avoid any confusion about sound issues.

Who get's to access? Find a balance between easy access and control over the space.
Our initial approach to presenting the gallery space was an opening event, where around 25 people could enter the space with their avatars, while also streaming it on Twitch. To get access to the link, we started a Google Form asking for an email address, to which we could send the link right before the event. The advantages of a sign-up form are of course that you can see how many people are taking part, and that you don't run into issues of "zoombombing". On the other hand, gate-keeping can reduce the amount of participants considerably, if it stops visitors from having the link available at the right time. This can lead them to turn away from the event altogether. That's why a balance between easy access and remaining in control over the space is important.
One feature which we discovered very late in the process is that when the maximum capacity of 25 people is reached, Hubs allows the designated admins of the space to use the "camera mode", essentially allowing you to stream your perspective of the room to the lobby, where users can follow along without entering the space. This can essentially replace a separate live stream on Twitch for example.

And now, what? Some thoughts on future use

Challenging the "white cube"
One question that we received in regards to our gallery space was why we chose to reproduce the classic "white-cube", when Hubs allows the creation of new experiences, because it isn't bound by material limitations.

This is an important question and one that would involve imagining the gallery space beyond a simulation. For what were trying to achieve, which was to create a space that would put the artworks front and center, the "white cube" seemed like an obvious and well-tested choice. Additionally, because Hubs is a learning experience for anyone visiting the gallery, with buttons, controls and functions that need to be explored and understood, it seemed important to reduce the structure of the space to something that was immediately familiar. While of course there is an interesting aesthetic to Mozilla Hubs spaces that imagine a sort of digital "cacophony" with Y2K aesthetics and completely unexpected physics and dynamics, it is important not to lose focus of the user experience. If presenting artworks is the main goal, it is important that moving around in the exhibition becomes "natural".

Art made for digital spaces
However, it would be interesting to see how virtual gallery spaces in Mozilla Hubs and other tools can be shaped to take advantage of the virtuality of their creation. This also extends to the art that is presented. In our case, screenshots and other in-game photographic works as well as videos were the central element around which we build a gallery. Still, it would be very interesting to see how the space could be part of the creation process, so that the art itself becomes an experience in the virtual gallery space.

Mozilla Hubs in academia and future use
Now that this space exist, the question of its future potential remains. How can it be used in a university context? Could it be a meeting space, a place to hold seminars or even a break room? The possibilities of Mozilla Hubs are very exiting for academic purposes, and it will be interesting to see how these relatively easy tools could be used to improve the digital learning experience. Of course, the appeal of Hubs and these kind of virtual spaces can vanish as soon as users have experienced it a few times. Yet, as noted earlier, the game-like experience could add a new layer of experience to otherwise bleak virtual meetings. The possibility of sharing a space while separating into smaller groups also could provide an interesting dynamic that would break the feeling of separation in Zoom Breakout Rooms. Moving through the virtual space requires the attention of everyone who is joined, leading to a new feeling of presence, while at the same time, reducing the feeling of being watched through a video stream. The possibilities of avatars, either abstract or modeled after yourself allow an interactivity, while still keeping our individual surroundings private.