**Presentation - Environment Creation**

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Hello everyone and welcome my today's presentation will be on the topic "Creating Environments in Games and Films." My name is Šimon Macháč, and I am a master's student at The Academy of Performing Arts in Bratislava.

Today, i will discussing the issue of creating environments within the realm of gaming and films. From my perspective, environments in films or games are rarely foregrounded and are often underestimated, yet the environment is one of the key components that is frequently as important as the story itself. The space surrounding our heroes and stories can often tell a tale even without the need for action, and in games, it can guide us where the author intended without the need for a single navigational point. But how is this possible?

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The field of environment design is complex and its fundamentals can be found in interior design. The interior design shares many basic aspects with the environments we use in films or games. When we look at any of the fundamental principles of interior design, we find their application in the environments of games and films. For example, the principles of contrast. Contrast helps us create visually striking spaces, and its key lies in the combination of opposing elements. Oppositeness disrupts the flatness and monotony of space, adding our intended essence and harmony. Contrast can be achieved by placing elements with contrasting characteristics together in space, and this can be accomplished through various aspects of design, such as contrast in color, shape, size, materials, textures, or style. When using contrast in your environment, it's important to remember that too much contrast can make the space where our viewer or player will be too chaotic, eliciting the exact opposite of highlighting and interest from the space. Therefore, it is essential to find the right balance when using contrast, as with contrast, less is often more. Contrast provides visual interest and helps define spaces. When used correctly, it can make a room feel dynamic and exciting or highlight key points in games where we want to direct the player.

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A good example is also Post-Impressionist art. Such as this painting by Rembrandt.

In the painting, we see the use of contrast to highlight the object of interest and its so-called dreamview. But to not just focus on painting, we can show the same utilization of contrast in the movie "The Lord of the Rings," which most people are probably familiar with.

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"The Lord of the Rings" is a perfect example of the use of contrast in film in this particular shot. Just one look at this frame explains to us, even without any action, what the essence of the scene will be. This principle of contrasts at various levels can be observed even more in games, where contrasts are often used to highlight and generate interest, as mentioned earlier. Contrast in games has become a well-established standard, sometimes even excessively so. The essence of contrast in games was intended for simple navigation of the player to where you planned without the players even being aware of it.

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A fantastic example is the Assassin's Creed game series, known for its parkour mechanics in open spaces, which can be challenging in terms of player orientation on where they can and cannot jump. They utilize all possible contrasts for this purpose.

For the example of contrast, I used a mission where we try to escape from the enemy.

In the first screenshot frome game, it's precisely the two white cloths leading us up the stairs, and players don't even realize it.

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In the second screenshot, after jumping onto the boxes, the mix of repetition of the familiar object complemented by the light contrast guides us further.

However, what is less visible but very significant is precisely the striking red carpet at the end of this pattern, which guides us to jump into its space. Such almost invisible elements are crucial for orientation, and contrast needs to be considered because, with the right use, it can elevate our environments to a higher level.

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Color

The use of colors is a powerful tool and is at the core of the psychological impact on our viewers and players. It is often intertwined with other fundamental elements, through which it can help influence many perceptions of players or viewers. Color can convey emotions, and moods, often tied to a specific narrative, along with the involvement of other components, allowing us to immediately clarify the dynamics of our storytelling environment, such as marking the position of our main antagonist, all with just the use of color.

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Furthermore, color can be used in other senses; for example, color has the ability to visually expand or shrink spaces through light. Bright colors such as white can optically enlarge our spaces, while darker colors tend to constrict them. This understanding can be helpful, for instance, in creating dramatic environments or visually more open spaces in stories. This phenomenon arises from the fact that bright colors necessarily reflect more light, while dark colors absorb light. This, however, may not be the only way; these principles of color can also be interconnected.

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For example, if we paint the ceiling and the back wall with darker colors and leave the side walls bright, we can expand the space sideways.

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This is a technique that can be utilized in hallways or narrow corridors. There's much more to discuss on this topic, but if you're interested in learning more about this principle, you can read about it in an article by Eduardo Souza on archdaily.com titled "How Colors Change the Perception of Interior Spaces."

Furthermore, colors can be utilized to convey emotional mood, which clarifies to the viewer and engages the player in the current emotion.

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Cold colors evoke loneliness, and sadness, often associated with scenes using colors such as blue or purple. A great example of such utilization in enviroments is the film "Blade Runner 2049" from 2017, which used a combination of these colors for lonely scenes. This strengthened the emotional impact of those moments even further.

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Color can also be associated with narratives and time, often used alongside repetition, gradually teaching our players or viewers which color refers to which timeline or specific narrative. It's important to consider this in stories from the initial stages, and it often refers back to the narrative.

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Color, especially in games, is often used to differentiate between different areas. For example, in "The Legend of Zelda: Breath of the Wild," colors are an important tool for navigation and orientation in the vast open world of the game. Each region in the game has its characteristic color, which helps the player distinguish between different areas. Green symbolizes grass Hyrule Field, blue is associated with water and sky areas, while red and yellow-orange represent volcanic regions. This ingenious use of colors in the game allows the player to intuitively recognize and explore various parts of the game world.

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Another principle is, for example, pattern. Pattern is about repetition, but not in this sense.

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Pattern is about similarities created by the story and its idea. A good example is the films of Wes Anderson. Wes Anderson has a well-established pattern in the form of pastel, flat environments with uniform color palettes. Their simplicity and visual style are evident across all of his work, and it's one of the many reasons why people adore them. All of this encapsulates his pattern, which often needs to be strictly adhered to throughout the creation of the environment in the film.

The essence of pattern is association based on similarities. As we've seen with the Assassin's Creed games with the elements for jumping, this association is used across all environments. This simple and quick means of identification can be utilized in many ways for associations. We can teach the viewer or player to associate and thus subconsciously provide them with information we want them to perceive. It can be about color, objects in the environment, but ultimately it can be about anything. For example, in the film "Gone Girl" by David Fincher, time and even the psychological state are conveyed to us through the repetition of scenes and our environment.

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Order

Order can mean this.

Or This

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Order, in this context, refers to the presentation of order in our story. Order mainly concerns consistency and should be conditioned by our story in all its forms.

One of the first things to focus on right from the start is whether you understand the story and learn as much as possible about the author's ideas. Where does the story take place? What do we want to show to the audience/players and in what form? These and many other questions are critical. Once we have the basics, we need to gather information about what we want to create. For example, do we want to create a post-apocalyptic metro environment? Here, many questions arise immediately, such as the culture where the story takes place, as there is a big difference between a metro in Russia and one in China. What is the time period, future, or past of the story? Are there any significant technologies in this story? But also from a technical point of view, where do we want our player or camera to go? What should they see and what should be subtly shown? All of this has enormous implications for our environment, and any misunderstanding within the team or change in these questions that would occur later in the process could cost a huge amount of time.

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This brings me to another part I'd like to mention today, and yes, it won't be anything other than the widely discussed AI. AI is changing our industry, and from my perspective, to the better. Work that once took tens to hundreds of hours has now been significantly shortened, and this is also evident in environment creation. Today, we can create 2D environments using AI, which almost everyone who's been interested in it has tried. But there are many other AI tools, one of my favorites being Luma AI, which opens up possibilities for creating 3D models using AI. The first function is based on photogrammetry. The difference between Luma Capture and standard photogrammetry is that the AI it uses speeds up the calculation for model generation at tremendous

speed and reduces file sizes, thereby increasing the speed of model display. All of this runs on Nvidia's Nerf system. Nerf uses neural network learning to render images in the so-called fields of neural radiation.

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This system still has its problems today. However, with proper use, this system can already be utilized in a professional environment.

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Its application can be sought in backgrounds with functional lighting changes, and full-fledged reflections, and by leveraging Nerf's capabilities, we can turn its limitations into an advantage, thus creating a new style of art for videos, for example, for music videos.

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Another function that is more interesting to me is Genie from Lumalabs. It's an AI that creates models directly just by typing the word we want to generate. Such a possibility gives artists a tremendous amount of options as it saves time without the need to create or purchase 3D models for scene design, as Genie from LumaLabs is free.

This technique still has its drawbacks today, such as sometimes the usability of textures in the generated model, but these can be manually corrected or we can involve other AI software for their refinement. However, technology has been improving lately, so the final quality of textures created by this system has also increased, reducing the need for adjustments.

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On the sample, you can see the latest model from Genie, which aimed to create a croissant solely using words. It's amazing how this technology has advanced, and I look forward to seeing it in a few years.

Two of the most flexible AI tools that can help us with this are Dream Texture and the new Airen 4D system. Both of these AI tools work on a similar principle and give us the ability to create environments, assets, and textures directly in 3D software. All you need to do is write down what you imagine. For example, if you need a texture for a model, just specify what you need, assign the size and quality of the texture, and it will be created according to your texture request, which we can vary endlessly.

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Such textures in new AI models are already essentially comparable to textures used in professional environments, and other advantages include infinite tiling, as the texture can be generated infinitely. Plus, it creates perfect connections between two different textures that intersect. Another option is to work with any texture size we specify, so if we need higher quality, we just generate higher quality, which we can also use in reverse to easily optimize textures according to our needs.

Another way to use Dream Texture and Airen 4D is for generating output, essentially functioning as a render engine. What's essential, though, is that unlike standard render engines, they are much more user-friendly. All you need to do is envision the space and enter your imagined prompt. To better illustrate this, let's consider an example with an apple. Imagine we want to create an advertisement featuring an apple.

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All we need to do is create a simple model representing the space and the basic shape of our imagined object, enter the prompt, and voila, we have our envisioned render. If we want it to look different, we simply create another variation or adjust the prompt.

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This system also supports the option to assign materials to our object models, based on which it can better create our envisioned material.

These AI tools open up the possibility to create a huge number of variations and changes in a relatively short time.

Such a workflow allows us to directly discuss designs with the client and make real-time changes to the 3D space according to the visions of both you and the client. This takes the efficiency of creating environments to a different level, one that was previously only dreamed of.

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At the end, I would like to emphasize that creating environments in games and movies is a demanding discipline that requires not only technical skills but also artistic vision and an understanding of how the environment emotionally affects the viewer or player. It's important to realize that artificial intelligence won't solve all our tasks for us.

I hope this lecture provided a useful insight into the world of environment creation and inspired further exploration of this fascinating area. Remember that every detail created in the environment has the potential to influence our perception and engage us in the story or experience.

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Thank you all for your participation and interest. If you have any further questions, don't hesitate to ask. I wish you a pleasant rest of the day and much success in your own creative endeavors.

Thank you for your attention.