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Generative Artificial Intelligence Program and Service: ImagineX

by
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A Thesis Submitted in Partial Fulfillment of the Requirements for the
Degree of Master of Fine Art in Visual Communication Design

School of Design
College of Art and Design

Rochester Institute of Technology
Rochester, NY
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Committee Approval

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Date

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Date

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Abstract

The idea to facilitate the creation of personal spaces that afford privacy, comfort, and autonomy to individuals in need seems to be especially significant while availability and affordability of physical spaces are constrained. This project proposes a system called ImagineX which is a generative artificial intelligence program and service that can generate virtual 3D spaces for users. Users can create customized 3D environments tailored to their specific needs and preferences simply by inputting word prompts. By connecting the program from a tablet to a virtual reality (VR) system, users can experience and interact with these virtual spaces in an immersive manner.

Keywords

Virtual Reality, Immersive Virtual Space, Relaxation, Generative Artificial Intelligence

Problem Statement

In numerous regions, the availability and affordability of physical spaces like residences, workplaces, and recreational areas can be constrained. This scarcity of space poses obstacles to individuals in their pursuit of personal interests, engagement in creative endeavors, and seeking solace. An immersive tablet-to-VR program was designed to empower users to effortlessly construct customized virtual 3D spaces that cater to their unique requirements through the simple input of word prompts.

Solution

“A special spot for kids to hide in can foster creativity, allow them to become independent thinkers, and enjoy a sense of ownership in their personal space,” says Kami Kinkaid(2020), an architect at Perkins and Will.[1] The idea of the ImagineX system started from a childhood dream that I’ve yearned to create a secret hideout space, a place where I could retreat from the world and enjoy solitude. However, my fear of being physically alone has compelled me to always have a roommate, leaving me without the privacy and personal space I long for. Stacey Nashn(2022) mentioned that alone time can encourage independence and helps build confidence in your ability to be alone, act alone, and find enjoyment alone.[2] It can also help lower levels of depression, increase self-esteem, and build stronger emotion regulation skills.[3] Solitude can help develop these skills without reliance on another person to know your thoughts, values, and feelings. In addition to the findings, I distributed a questionnaire about relaxation preferences among people of different age groups, and the results returned as diverse. The majority of the participants responded with music, exercise, and sleep. The results align with partial research findings; additionally, some articles suggest activities such as meditation, practicing creative visualization, embracing childlike behavior, and immersing oneself in natural scenery, among others.[4][5] The solutions of Virtual Reality emerged after identifying these key points in the initial research. They require minimum space and cost but offer the most potential and possibilities.

Zippa's Virtual Reality User Statistics(2023) indicate that the global VR user count is estimated to be approximately 171 million.[6] The age group of 25 to 34 constitutes 23% of users for VR/AR devices, falling within the range of individuals aged 18 to 33, who experience the highest levels of stress in the U.S. according to the American Psychological Association (APA).[7] However, in a 2021 study published in the journal Social Psychiatry and Psychiatric Epidemiology, authored by Riches S, Azevedo L, Bird L, Pisani S, and Valmaggia L, it was proposed that engaging in virtual reality (VR) encounters involving serene and pleasant virtual settings, facilitated by a head-mounted display (HMD), seems to facilitate relaxation.[8] The research findings align with the overarching objective of this project. Through the incorporation of visuals and complementary simulations, users can achieve the aim of experiencing relaxation within a virtual space, effectively addressing the constraints of limited space and resources.[9] To increase the customizability of this system, Artificial Intelligence was incorporated to deliver an optimal user experience. The market of artificial intelligence continues to expand. In 2022, 35% of organizations indicated that they were employing artificial intelligence technology in various capacities within their

operations.[10] In this system, artificial intelligence plays a role in crafting personalized virtual 3D environments by utilizing user-inputted words. Its purpose is to optimize the alignment between users' creative ideas and the AI-generated output, thereby enhancing the overall user experience with ImagineX. Initiating this system takes minimal time; it commences by adhering to instructions and entering word prompts on a tablet. This enables the system to produce virtual rooms that users can select and customize. Afterward, wearing the VR headset allows users to effortlessly delve into the newly crafted space and begin exploration. The objective of ImagineX is to offer an adaptable and tailor-made encounter, granting users the ability to mold their virtual environments in line with their desires and needs. Subsequently, they can project their creativity into an immersive 3D space that boasts interactivity and realism. The combination of generative AI and VR technology enhances the immersion factor, making it possible for users to explore and interact with the virtual environments as if they were physically present within them.

ImagineX possesses 4 key features:

1. **Personalized VR Experience:** The system provides an extensive degree of customization, affording users the ability to customize their virtual reality (VR) encounter in accordance with their preferences and requirements. This guarantees a more captivating and individualized journey.
2. **User-friendly Input:** Through the utilization of straightforward word prompts, the system simplifies the process for users to contribute input and design their virtual surroundings. This instinctive input approach eradicates complexity and elevates the overall user experience.
3. **Enhanced Accessibility:** The system has been crafted for enhanced accessibility, notably by enabling effortless connectivity between a tablet and a VR system. This adaptability broadens the user demographic and enables a broader spectrum of interactions and experiences.
4. **Immersive Interactivity:** Centered on creating immersion, the system empowers users to partake in interactive encounters within their virtual settings. This immersive engagement amplifies involvement and delivers a heightened sense of realism and captivation.

The flexibility of this system allows for its utilization in various ways as well. Whether it's designing virtual homes, landscapes, architectural concepts, or imaginative realms, ImagineX offers users a platform to bring their ideas to life in a virtual space. It opens up opportunities for various industries such as architecture, interior design, gaming, education, and more.

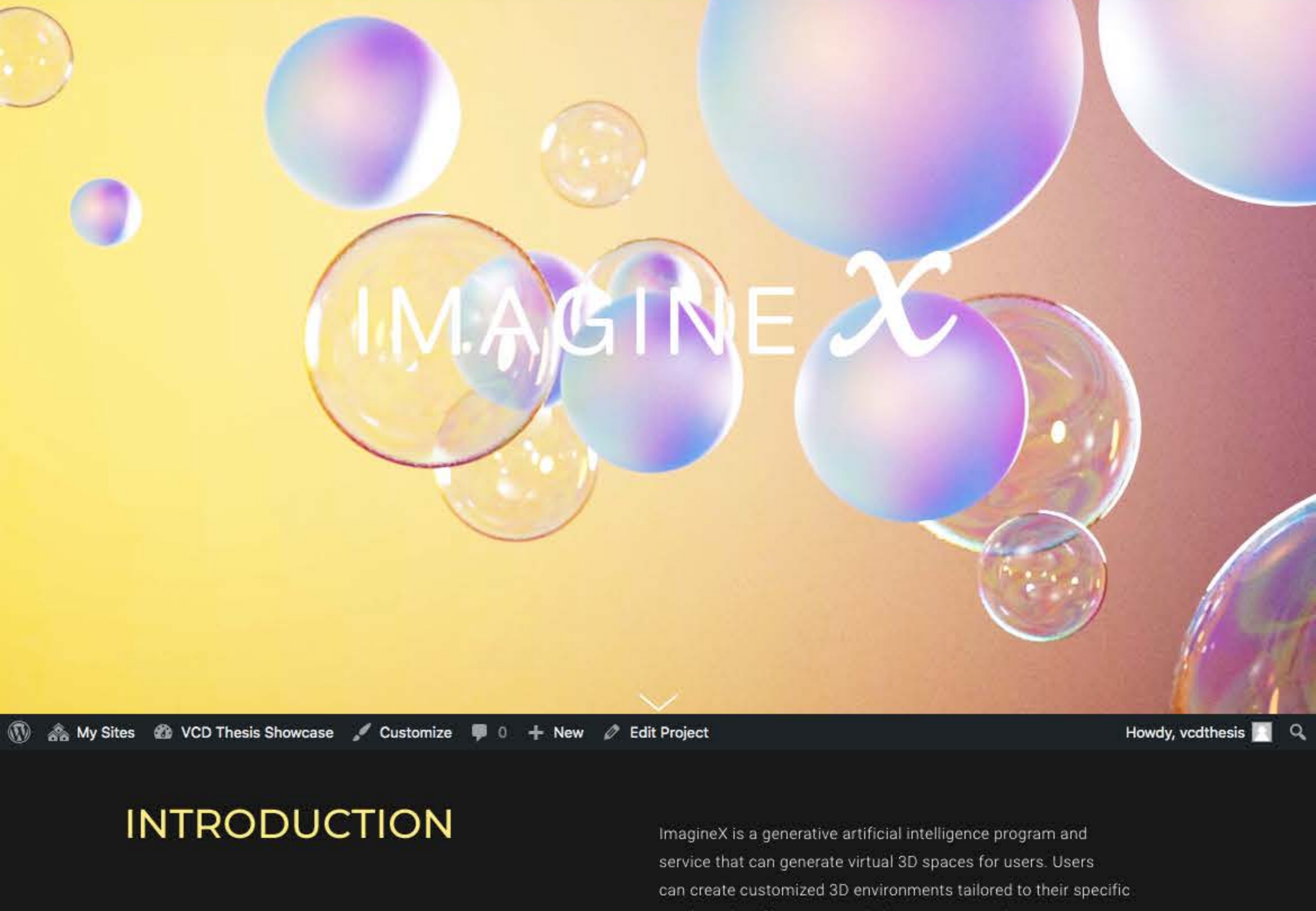
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INTRODUCTION

ImagineX is a generative artificial intelligence program and service that can generate virtual 3D spaces for users. Users can create customized 3D environments tailored to their specific needs and preferences simply by inputting words prompts. By connecting the program from a tablet to a virtual reality (VR) system, users can experience and interact with these virtual spaces in an immersive manner.

THE PROBLEM

In numerous regions, the availability and affordability of physical spaces like residences, workplaces, and recreational areas can be constrained. This scarcity of space poses obstacles to individuals in their pursuit of personal interests, engagement in creative endeavors, and seeking solace.

How might we facilitate the creation of personal spaces that afford privacy, comfort, and autonomy to individuals in need?

SOLUTION

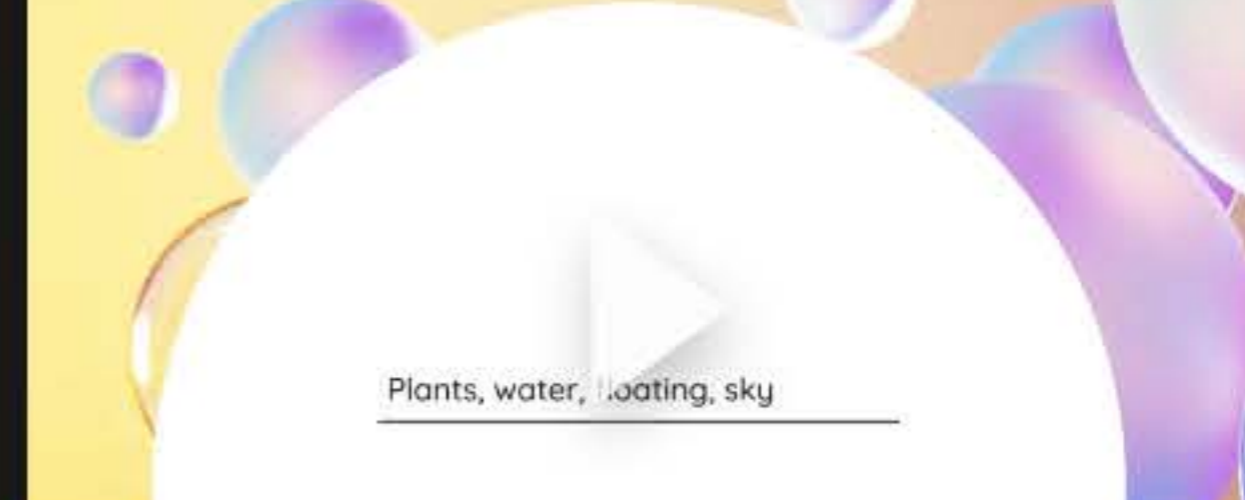
An immersive tablet-to-VR program that empowers users to effortlessly construct customized virtual 3D spaces that cater to their unique requirements through the simple input of word prompts.



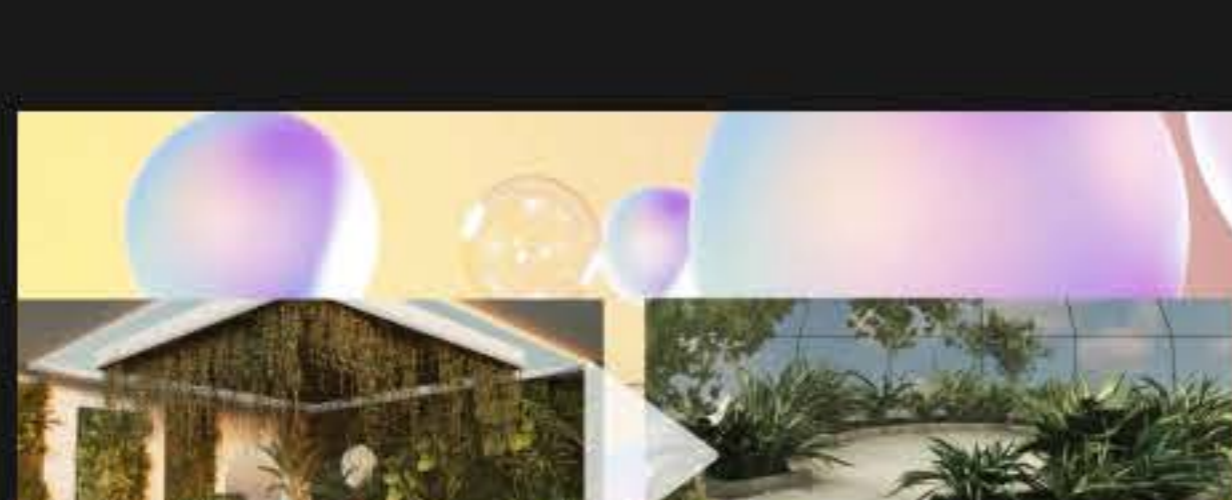
HOW DOES IT WORK?



Step 1:
Close your eyes and envision a picture from your favorite place, dream, or imagination. Take a moment to observe it closely.



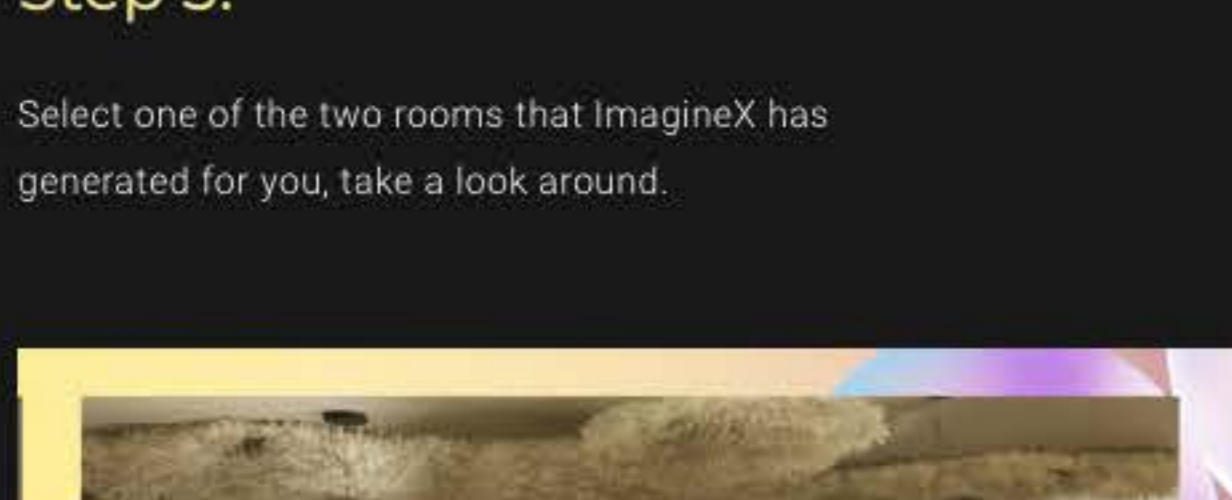
Step 2:
Describe to ImagineX in words what you saw when you were observing that picture in your mind.



Step 3:
Select one of the two rooms that ImagineX has generated for you, take a look around.



Step 4:
Put on your VR glasses and indulge in some much-needed self-care and relaxation time.



Step 5:
Save and enjoy the same scene again in the future!

ImagineX aims to provide a flexible and customizable experience, allowing users to shape their virtual spaces according to their preferences and requirements. The combination of generative AI and VR technology enhances the immersion factor, making it possible for users to explore and interact with the virtual environments as if they were physically present within them.

Whether it's designing virtual homes, landscapes, architectural concepts, or imaginative realms, ImagineX offers users a platform to bring their ideas to life in a virtual space. It opens up opportunities for various industries such as architecture, interior design, gaming, education, and more.



PROCESS

Initial Thoughts & Ideation

Ever since my childhood, I've yearned to create a secret hideout space, a place where I could retreat from the world and enjoy solitude. However, my fear of being physically alone has compelled me to always have a roommate, leaving me without the privacy and personal space I long for. Despite these constraints, the desire to spend some free time in a customized personal space of my own has never waned. That's why the idea of constructing a VR system emerged as a viable alternative, allowing me to realize my dream space despite limitations of funds, space, and time.

Research

How Important Is Alone Time for Mental Health?

Kendra Kerry, the author of the "Everything Psychology Book (2nd Edition)", has suggested that finding time to be alone can also have a number of key benefits:

- Improved personal exploration
- Increased creativity
- More social energy

Quick, simple ways to relax:

- Meditate
- Listen to music
- Practice creative visualization
- Take some alone time
- Act like a kid
- Look at nature scenery

Can VR help you relax?

Riches S, Azevedo L, Bird L, Pisani S, Valmaggia L from Social Psychiatry and Psychiatr Epidemiology, a monthly peer-reviewed medical journal covering the epidemiology of psychiatric disorders, have suggested that Virtual reality (VR) experiences of pleasant and calming virtual environments, accessed with a head-mounted display (HMD), appear to promote relaxation.

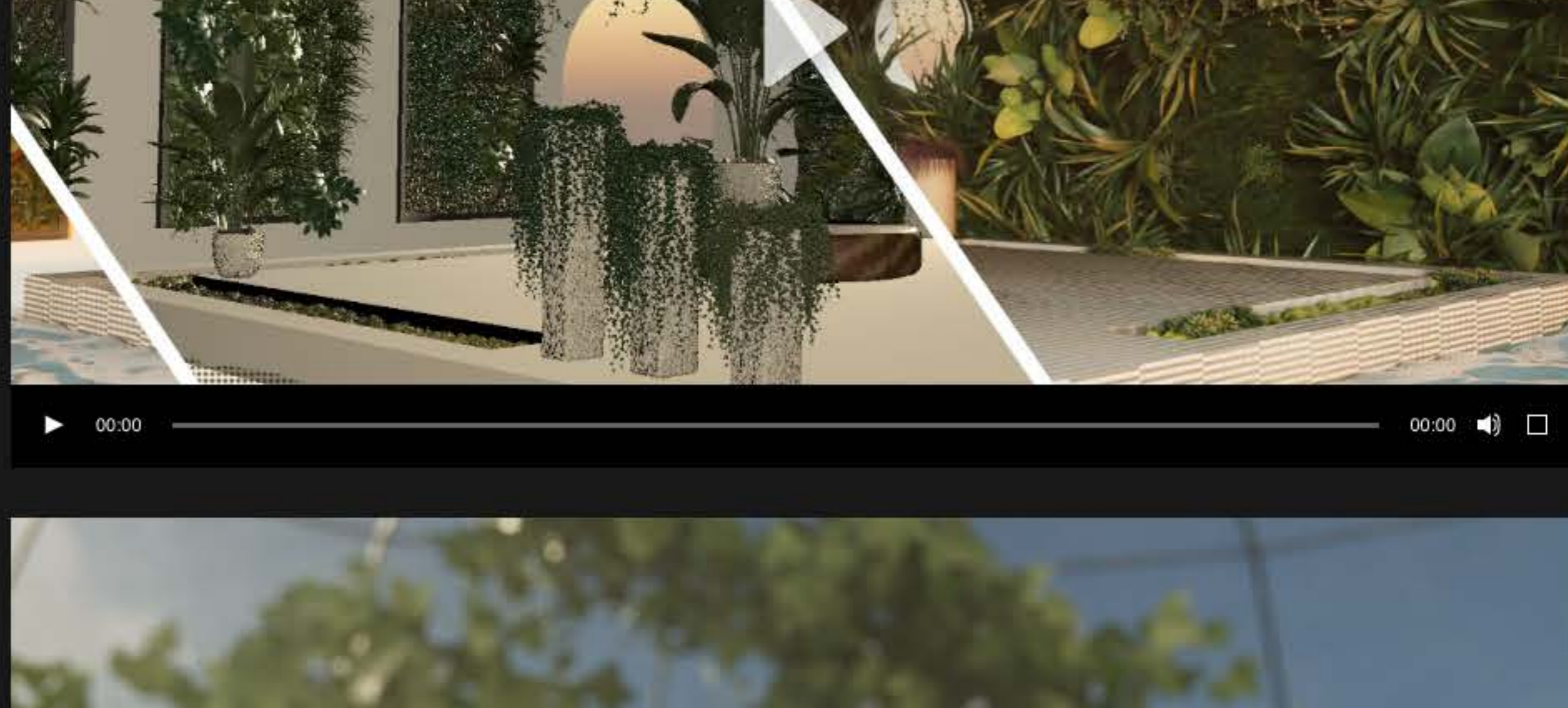
- Improved personal exploration
- Increased creativity
- More social energy

Assets

LOGO



3D Rendering



System Key Features

Personalized VR Experience

The system offers a high level of customization, allowing users to tailor their virtual reality (VR) experience according to their preferences and needs. This ensures a more engaging and personalized user journey.

User-Friendly Input

By utilizing simple word prompts, the system makes it easy for users to provide input and shape their virtual environments. This intuitive input method eliminates complexity and enhances the user experience.

Enhanced Accessibility

The system is designed to be more accessible, particularly by allowing seamless connectivity from a tablet to a VR system. This versatility expands the user base and facilitates a wider range of interactions and experiences.

Immersive Interactivity

With a focus on immersion, the system enables users to have interactive experiences within their virtual environments. This immersive interaction enhances engagement and provides a more realistic and captivating experience.

Conclusion

ImagineX, functioning as an immersive tablet-to-VR program, grants users the capabilities of a Personalized VR Experience, User-Friendly Input, Enhanced Accessibility, and Immersive Interactivity. With this system, users are empowered to seamlessly create and customize their own virtual 3D spaces.

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