

BitS

Kaai Spider-Bot C o n t a i n e r Breaks Free! Adventurous Escapade at La Grand Place!

CampusXplore Alive: Embark on the Ultimate Augmented Reality Adventure at Kaai Campus





COSMONAUT G L A S S E S R O B B E R

A glasses-stealing cosmonaut wanted by the police. Full story behind this audacious criminal on page x

Bachelor's Study: Multimedia & Creative Technologies

This project is proudly presented as part of my Bachelor's thesis for Erasmus Hogeschool Brussel.

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PREFACE

Unveiling CampusXplore Alive – A Journey into Augmented Reality

Greetings, dear readers! Welcome to this enthralling exploration into the world of augmented reality. Within the pages of this paper, we unveil the story behind CampusXplore Alive, an extraordinary AR-based location experience crafted as the final project for the Bachelor's program in Multimedia and Creative Technologies at Erasmushogeschool Brussel.

A Dream Awakened:

Three years ago, I embarked on a serendipitous journey into the realm of Augmented Reality. Discovering this ground-breaking technology ignited a spark within me, fueling a dream that would eventually take shape as my final project. Over time, this dream evolved, and one year ago, it crystalized into the ambitious vision of creating an AR-based location experience that would revolutionize campus exploration.

Acknowledgments:

During this extraordinary undertaking, I was fortunate to receive guidance and support from esteemed individuals who have played a significant role in shaping CampusX-plore Alive. I would like to extend my deepest gratitude to Mr. Peter Dickx, whose teachings during my academic journey kindled my passion for AR and inspired the path I pursued.

Additionally, I express my heartfelt gratitude to the developers at Niantic Lightship AR for their exceptional Unity SDK, which has paved the way for the creation of remarkable AR experiences. Their ongoing assistance and the collaborative spirit within their vibrant Discord community have been invaluable sources of inspiration and expertise.

Furthermore, I extend my gratitude to Bruno Dejonghe and Bas Gezelle from PLAYAR, who graciously welcomed me as a student jobber and provided invaluable mentorship. The collective wisdom and expertise of my colleagues, including developers, 3D artists, and designers, have profoundly enriched my understanding of AR technology and enhanced the completion of this project.

Embarking on the Journey:

Together, we embark on a captivating adventure, delving into the immersive world of CampusXplore Alive. As you immerse yourself in the following pages, I invite you to witness the convergence of technology and imagination, as the virtual and physical seamlessly intertwine.

With gratitude and enthusiasm,

Yassin Benhaddou











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Introduction

Unveiling the Augmented Reality Revolution

In this era of technological marvels, one innovation has captured the imagination of the world: Augmented Reality (AR). Blending the virtual and physical realms, AR has become a powerful tool that transforms our perception of reality. It overlays digital information onto our surroundings, enhancing our experiences in ways we could never have imagined.

AR-Based Location Experiences: Where Reality Meets Imagination

Today, AR is gaining unprecedented popularity. Brands and industries are eagerly embracing this transformative technology, recognizing its potential to revolutionize how we interact with the world. From immersive marketing campaigns to interactive educational tools, AR-based experiences have emerged as game-changers in engaging and captivating audiences.

CampusXplore Alive: Igniting the Magic of Our Campus

In the midst of this augmented reality revolution, our esteemed institution, the Campus of Design, Art and Technology, is at the forefront of innovation. It was here that the vision of CampusXplore Alive was born, a remarkable augmented reality-based location experience designed to bring our beloved campus to life.

The Enchanting Tale Unfolds: A Cosmonaut's Mischief and the Free-Spirited Spider-Bot Container

Within the immersive realm of CampusXplore Alive, an enchanting tale unfolds. It begins with the mischievous escapades of a cosmonaut who has stolen the glasses of the iconic Fancy Building. As players embark on their journey, they witness the captivating transformation of the Spider-Bot container, which, driven by an unyielding desire for freedom, breaks free from its confines within the campus.

Crafting Digital Wonders: 2D Design Graphics and Intricate 3D Models

Creating such a captivating AR experience required a labor of love. Every visual element, from the charming 2D design graphics to the intricate 3D models, was meticulously crafted. With my passion for AR and entertainment , I delved into the realm of 3D modeling using Blender. Each building, character, and object came to life through the power of creativity and Augmented Reality.

A Labor of Love: Game Physics, Coding, and 3D Modeling

Developing the gameplay mechanics and interactions demanded a deep understanding of game physics and coding. Utilizing the versatile Unity engine and the Lightship ARDK SDK, I harnessed the power of technology to bring the world of CampusXplore Alive to fruition. It was an immersive learning experience, pushing the boundaries of my skills in coding, scripting, and game development.

Empowering Future XR Specialists: Inspiring Curiosity and Exploration

Beyond the creation of CampusXplore Alive, my goal was to inspire future XR specialists. Aspiring students who visit our campus will witness the limitless possibilities of XR technology. By showcasing this AR-based location experience, I aim to ignite their curiosity and fuel their passion for the XR specialization. With their creativity and technical prowess, they too can shape the future of augmented reality.

An Extraordinary Journey Begins: Blending Reality and Imagination

As you embark on this extraordinary journey through the pages that follow, prepare to be immersed in the seamless blend of reality and imagination. CampusXplore Alive opens a gateway to a world where our campus comes alive, where buildings have faces, emotions, and stories to tell. It is an ode to the power of AR, the fusion of technology and creativity, and the boundless potential of our campus community.

Together, let us venture forth into this augmented reality adventure, where dreams become tangible and imagination knows no limits.

Literature Review

Unlocking the Potential of AR-Based Location Experiences

In today's digital age, augmented reality (AR) has emerged as a transformative technology, revolutionizing the way we perceive and interact with the world around us. AR-based location experiences, in particular, have garnered significant attention and are poised to be a game-changer in various industries.

The potential of AR-based location experiences extends far beyond entertainment and novelty. Brands, cities, and educational institutions are increasingly recognizing the value and impact of adopting this technology. For instance, renowned brands have already embraced AR to enhance customer experiences, offering virtual try-on options for products or delivering location-specific content.

Competitor analysis

Playing Pompidou

Snapchat and the Centre Pompidou have collaborated on an augmented reality experience called "Playing Pompidou" as part of Christian Marclay's "All Together" exhibition. Using Snap's Landmarker technology, the Centre Pompidou's façade is transformed into a musical instrument. Visitors can trigger an interactive audio and visual AR experience using Snapchat's camera, creating personalized music loops to share.



Louis Vuitton and artist Yayoi Kusama have teamed up for an augmented reality project that showcases Kusama's famous dots on iconic landmarks worldwide. The project involves landmarks like the Eiffel Tower, Statue of Liberty, Tower Bridge, Arc de Triomphe, Natural History Museum, and London's National Gallery being digitally adorned with Kusama's dots. This collaboration serves as a bridge between the online and offline worlds, as Louis Vuitton and Kusama digitally paint their dots on real-world structures.





Literature Review

Snapchat x NBA x Eiffel Tower

Busterwood Studio, an AR studio, has created an exciting AR experience for the NBA Paris Game 2023. The Eiffel Tower itself becomes part of the event, showcasing its enthusiasm for basketball. This landmarker experience fulfills the Iron Lady's dream, allowing visitors to engage with an augmented reality representation of the iconic landmark. The collaboration between Busterwood Studio, Snap Inc., and the National Basketball Association (NBA) has resulted in an incredible project that merges sports and technology, offering an immersive and unforgettable experience for fans and visitors alike

Google and Taito Reveal Augmented Reality 'Space Invaders' Game

Google and Taito, a Japanese games company, have joined forces to bring a new augmented reality version of the classic arcade game Space Invaders to life. This upcoming game, called SPACE INVADERS: World Defense, takes inspiration from the original gameplay and brings it into the real world using augmented reality technology. Players will take on the role of Earth's defenders, battling against invading Space Invaders in their own neighborhoods.

Snapchat Landmarker

Snapchat has created a Lens Landmarker (a location-based lens) to make several monuments dance. So when you're in a particular spot, like in front of the effeil turret, all you have to do is pull out your smartphone and film the monument. Once you've done that, the effeil turret will start dancing and spitting out colorful liqude! This experience is what inspired me to create my concept.









Concept

Introducing the Outrageous AR Campus Adventure!

Prepare to be transported to a whole new realm of interactive excitement with our groundbreaking AR campus experience. Imagine a world where reality blends seamlessly with imagination, where ordinary buildings come alive with animated faces, and mischievous spider bots roam freely. This mind-boggling adventure will take you on a journey through a whimsical campus landscape unlike anything you've ever seen.

For those unable to physically join us on campus, fear not! We've made it possible for remote participants to access the Spider Container through the Remote Container feature in our app. This means you can experience the excitement and wonder of the Spider Bot adventure from the comfort of your own city. Whether you're in Paris, London, or anywhere else in the world, the Spider Container will be right there with you, ready to transport you into the heart of the action.

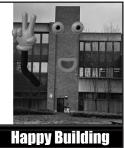
To showcase the boundless potential of our Spider Container, we recently embarked on an unforgettable photo shoot at the stunning La Grande Place. The Spider Bot container, brimming with character and mischief, graced the square, capturing the attention and imagination of all who witnessed its presence. It's a testament to the power of AR to transcend physical boundaries and bring our thrilling adventure to life in the most iconic locations.

But the Spider Bot is just the beginning. Prepare to encounter an eclectic cast of characters that inhabit our AR universe. Meet the mischievous Cosmonaut, a bumbling yet lovable troublemaker who has a penchant for causing chaos. Keep an eye out for the Fancy Building, an architectural marvel that emanates elegance and sophistication. And beware of the Bad Building, a misfit structure with a knack for mischief.

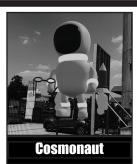
Amidst this vibrant tapestry of characters, you'll discover the Good Building, a towering structure with an extended arm, ever-ready to lend a helping hand. Its presence brings a sense of security and warmth, serving as a beacon of hope in our AR realm.



Spider-Bot Container



A Good Building
With A Arm



C o s m o n a u t Glasses Robber



A gracious and fancy Building



THE SPIDER BOT CONTAINER: HERO OR MENACE?

In a stunning turn of events, the esteemed students and teachers of EHB (Erasmushoogeschool Brussel) recently made a remarkable discovery. Their iconic Campus Kaai container, known for its symbolic presence, mysteriously transformed into the enigmatic Spider Bot Container. This newfound marvel roams freely across the charming streets of Brussels, sparking a wave of curiosity and raising a question that has captivated the masses: Is the Spider Bot Container a force for good or an unforeseen menace?

At the Daily EHB, our dedicated journalists have been diligently tracking the Spider Bot's every move, striving to unravel the truth behind its intentions. Their investigations and thorough analysis have led them to firmly believe that this awe-inspiring creation, with its uncanny ability to traverse the city, poses a potential threat.



YASSIN, CREATOR OF THE SPI-DER BOT CONTAINER INTERVIEW

Now let's start with the story behind spider Bot container. the process behind its creation.

When I started, it was all about scanning the container using various 3D scan apps like Polycams, Lightship Niantic Wayfare, Luma, Reality Scan, and Kiri Engine. Then combining all these scans in Blender and picking the best parts to create the perfect 3D model of the container.

Next, I needed to make the Spider Bot move. So, I researched A LOT, after all the research i managed to create a first spider-Bot Box on blender and animated it for a first test and it worked great! so I could finally do the same for the container, Later I finally got the first version with 6 legs. And let me tell you, it felt like MAGIC when I saw it moving for the first time. My heart was pounding with joy; I couldn't believe what I had achieved!

rendering the school's 3D scanned map inside a 3D box and placing this box where the real container is, it created an illusion as if the real container is invisible.

But that excitement was short-lived... D=

And there you have it, the birth of the Spider Bot Container, a project filled with ups and

Why? simply because the elements used in the tutorial I followed are based on how to create a 3D element in Blender and only for Blender, so it cannot be used on other platforms like Unity or Unreal Engine because it uses modifiers specific to Blender and also multiple armatures! This has increased my stress levels and tiredness haha.

But that's not the end, so I started to understand the use of rigs and armatures in Blender because that's what works really well for Unity. After extensive research, I finally learned how to create my own 3D armature for my model. Now all that's left for me is to animate my Spider-Bot Container!

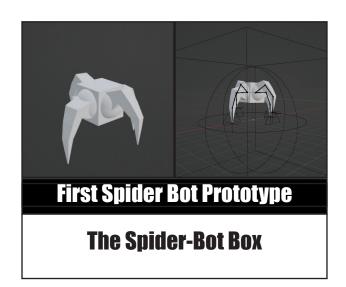
Very important tip that I learned! To create a natural animation of a spider's movement, it's simple, you just have to make a half-circle. The tip of my spider's leg just needs to make a half-circle and voila!! It gives us a natural movement!"

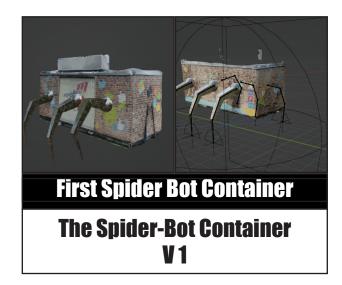
During my internship at PLAYAR Studio, Daniel Pelka, a fantastic 3D artist, gave me some killer tips. The shader smooth effect, adding cylinders to the legs for more mechanical movement, and voila! The Spider Bot was nearly perfect!

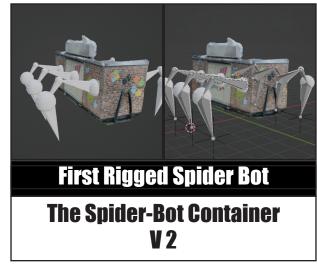
Now, the audio! I needed robot sounds. I couldn't find the right ones, so I mixed some audios using Adobe Premiere Pro. Synced it with my spider bot animation video and the result become GOOD!

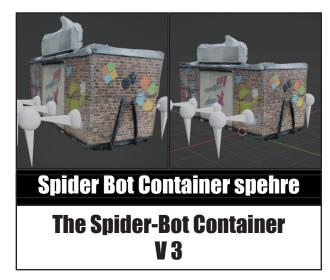
But the REAL challenge was making the real container invisible in 3D and in real-time. That took blood, sweat, and tears. After a lot of brainstorming, I developed a technique in Unity which involved rendering only certain objects with specific tags. By

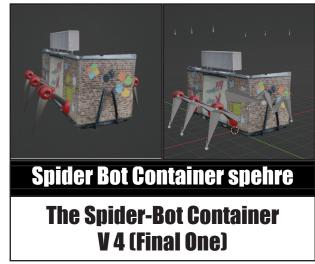
GALLERY CREATION.









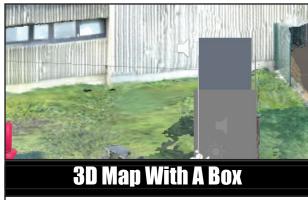


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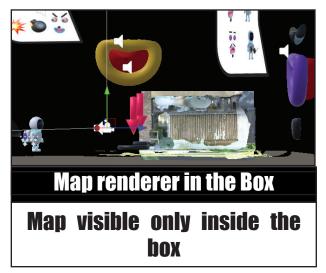


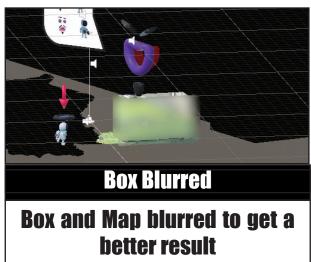
A complete 3D model of the map with planes representing the sky.





A box at the container position





The Cosmonaut

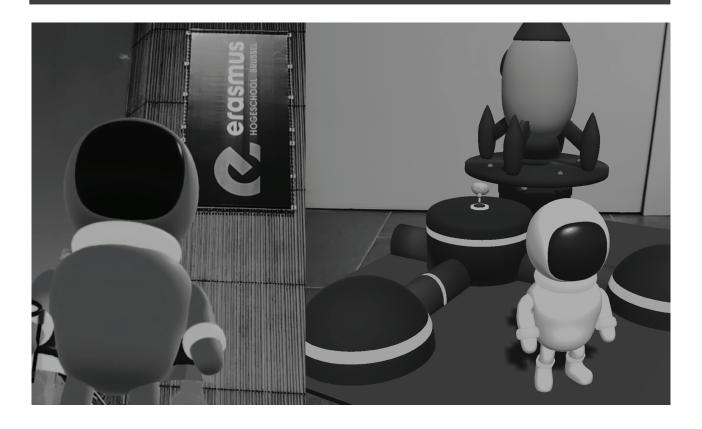
THE COSMONAUT INVASION

Today, we have an intriguing story to share about a mischievous character known as the Cosmonaut. Rumor has it that this Cosmonaut has brought chaos to the Campus Kaai, stealing glasses and even the coveted glasses from the fancy building. To add to the mayhem, the Cosmonaut has squatted the campus with his own space station and rocket! The question on everyone's minds is whether this Cosmonaut is a cunning villain or just a misunderstood intergalactic explorer.

Fun Thing To Know:

While creating the Cosmonaut for CampusXplore Alive, Yassin took part in the AR-Cade challenge: a challenge organized by Lightship and Loak, an application that publishes the work of AR developers and pays them for the numbers of plays! And he decided to introduce the cosmonaut to the challenge as the main character in Cosmo Explorer, an AR game in which you can control the cosmonaut and even pilot his rocket. The game is already very popular, with over 1.4 plays!





The Cosmonaut

THE COSMONAUT CREATION PROCESS

Yassin: During the creation of the Cosmonaut character, I utilized a combination of powerful tools and software to bring him to life. Blender, was instrumental in designing the Cosmonaut, along with his rocket, Jetpack and space station. With blender I was able to meticulously craft the character's appearance, paying close attention to details that would make him visually appealing and captivating.

To add dynamic animations and movements to the Cosmonaut, I turned to Mixamo, an online platform that offers a vast library of pre-made character animations. Mixamo simplifies the animation process by providing a wide range of ready-to-use motion-capture animations that can be applied to 3D models. This saved me considerable time and effort in creating complex animations from scratch.

One of the key features I incorporated into the Cosmonaut's gameplay was the dodge mechanic. To achieve this, I leveraged the physics engine within Unity, the game development platform I used for the AR experience. Unity's physics engine allowed me to implement realistic collision and movement behaviors, enabling the Cosmonaut to gracefully evade incoming projectiles. This added an exciting element of challenge and interactivity for users, as they attempted to hit the agile Cosmonaut.

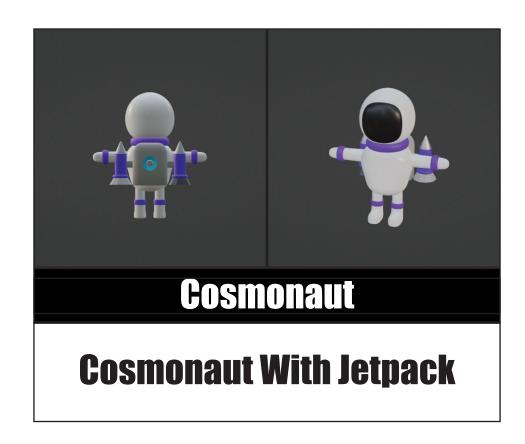
In summary, the creation of the Cosmonaut involved a multi-step process. Blender played a crucial role in the character's design and the development of his rocket and space station. Mixamo provided a vast array of pre-made animations that added life and fluidity to the character's movements. Finally, Unity's physics engine facilitated the implementation of the dodge mechanic, enhancing the overall gameplay experience.

The Cosmonaut

GALLERY CREATION.

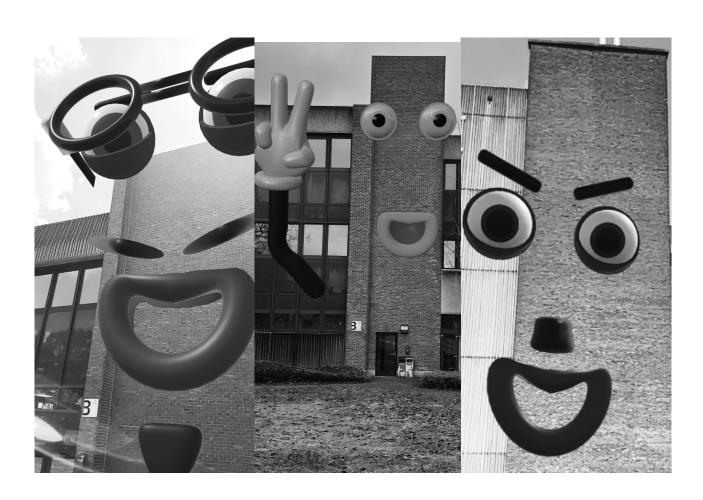






WHEN BUILDINGS COME TO LIFE - THE TALE OF THE ANIMATED FACES

In a stunning turn of events, the campus buildings have come alive, each with its own distinct personality and role to play. The Happy building spreads joy and positivity, while the Fancy building exudes elegance and sophistication. However, a cause for concern arises with the emergence of the Bad building, harboring mischievous intentions and posing a threat to the campus community.



THE CREATION PROCESS OF THE CARTOON FACES

Yassin: Allow me to share the journey of bringing the animated building faces to life. It all began with the idea of injecting more liveliness and personality into our campus environment. I wanted to create a playful and engaging experience, so I decided to animate the buildings with unique facial expressions.

To start the creation process, I designed cartoon-style faces for each building, carefully considering their individual characteristics. The Happy building exudes positivity, the Fancy building showcases elegance, and the Bad building adds a mischievous touch to the mix.

Next, I turned to Blender, to bring these designs to life. I sculpted and modeled the building faces, ensuring that they accurately represented the desired expressions and emotions.

One of the main challenges I faced was animating the mouths of the building faces. I wanted them to be expressive and lively, but I couldn't find any suitable tutorials that specifically catered to my needs in Unity. Determined to overcome this obstacle, I took matters into my own hands and rigged the mouths myself. It was a process of trial and error, experimenting with different techniques until I achieved the desired effect.

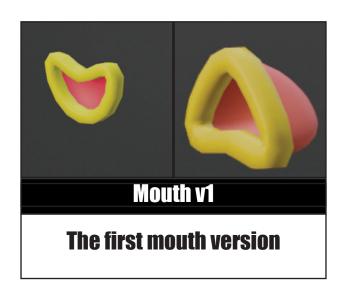
Incorporating feedback and suggestions from my teacher, Van Caneghem Jan, was pivotal in refining the creation. He encouraged me to go beyond the initial plan of uniform faces and explore different styles and emotions. This led me to add unique accessories like mustaches, beards, glasses, and even an arm, giving each building its own distinct identity.

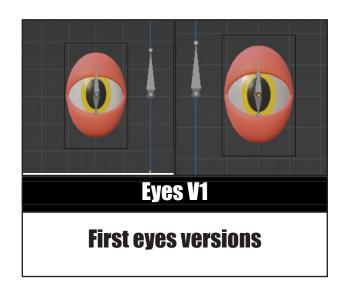
Once the building faces were finalized, I seamlessly integrated them into the Unity environment. Unity allowed me to apply animations and control the behaviors of the faces within the augmented reality experience. I utilized a combination of coding and animation tools to ensure smooth interactions, such as implementing a attack mechanic for the Bad building and incorporating a visual life bar system for feedback.

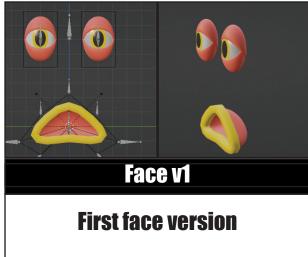
Seeing the animated building faces come to life in the AR experience has been incredibly rewarding. Witnessing the reactions of students and faculty as they interact with these characters fills me with joy and motivates me to continue pushing the boundaries of creativity and technology.

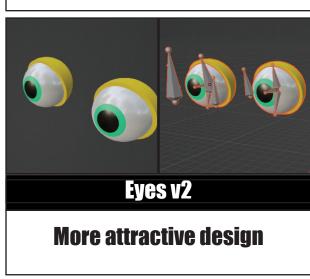
This entire process has been a labor of love, combining my passion for 3D modeling, animation, and augmented reality. I hope that this AR experience brings a sense of fun and wonder to our campus community, transforming the way we perceive and engage with our surroundings.

GALLERY CREATION.







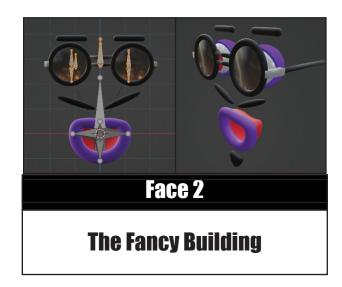


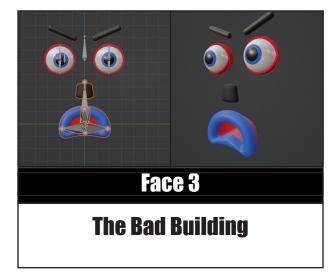




GALLERY CREATION.











Conclusion

CONCLUSION

In the realm of augmented reality, I embarked on an extraordinary journey to bring the EHB Campus to life. Through a unique AR-based location experience, ordinary objects were transformed into extraordinary entities, creating a world where A container became spider bots, buildings donned animated faces, and a mischievous cosmonaut wreaked havoc.

This project was a testament to my unwavering passion of Augmented Reality. I overcame countless challenges, from mastering the intricacies of 3D modeling and animation to exploring the frontiers of AR technology. With determination and resilience, I pushed the boundaries of what was thought possible, breathing life into my wildest imaginings.

The process was no easy feat. Countless hours were spent refining and perfecting every detail, from the intricate movements of the spider bot to the expressive faces of the buildings. I delved into the depths of software like Blender and Mixamo, harnessing their power to shape my creations with precision and artistry. It was a constant quest for innovation, with each step unveiling new possibilities and pushing my skills to new heights.

But it wasn't just about technical prowess; it was about infusing my creations with personality and charm. The Spider Bot, with its nimble legs and animated antics, captivated audiences and elicited both awe and amusement. The buildings, with their whimsical faces and distinct styles, breathed life into the campus, transforming it into a vibrant and playful environment.

Throughout this journey, I was guided by my insatiable curiosity and fueled by my love for popular culture. References to beloved anime and iconic characters found their way into my creation, adding an extra layer of depth and connection for fans and enthusiasts alike.

As I reflect on this project, I am filled with a sense of accomplishment and pride. I have created an AR experience that transcends the boundaries of reality, inviting users to explore, engage, and interact with the EHB Campus in ways never before imagined. It is a testament to the power of technology, creativity, and the boundless potential of human imagination.

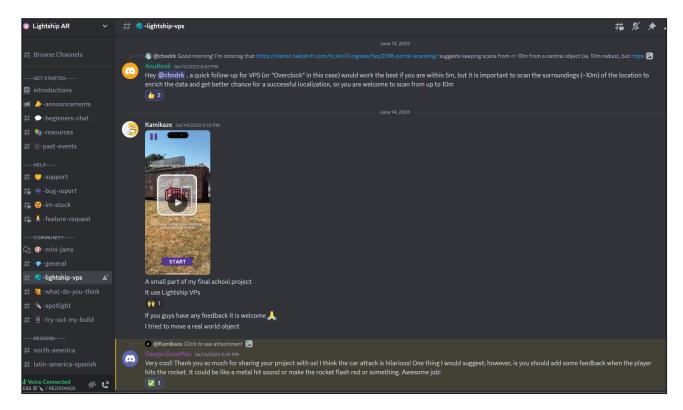
In the end, this project is not just a demonstration of technical prowess; it is a testament to the transformative power of storytelling and the ability of augmented reality to transport us to new worlds. I invite you to join me on this remarkable journey, as we continue to push the boundaries of what's possible and shape the future of AR experiences. Together, let's explore, create, and redefine the possibilities that lie before us.

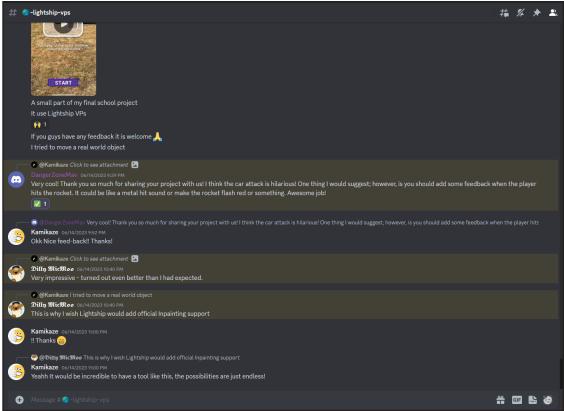
User Test

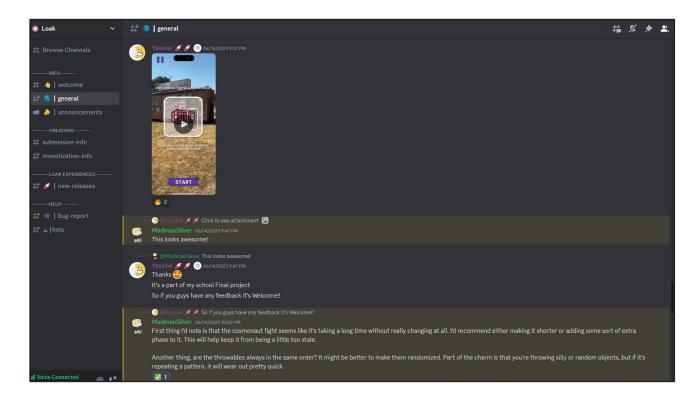
USER TESTING

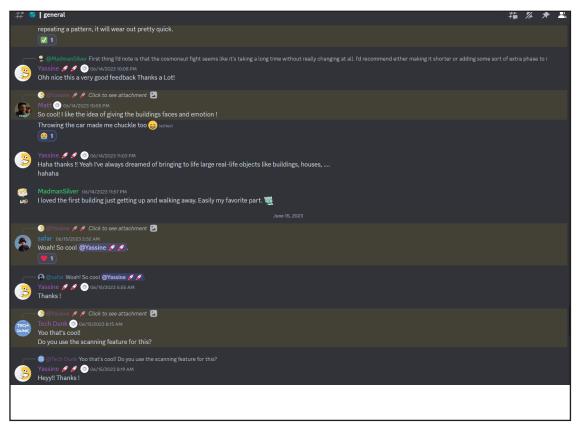
About user testing, I had the chance to have my experience tested by a lot of people, both students and teachers. I was able to carry out the tests the week of 05/06. The results were just incredible: everyone who tested my experience loved it, enjoyed it and was surprised by the AR experience, which made me very happy with the results. I was also able to gather as much feedback as possible in order to improve my application. Above all, I noticed a very important point that I intend to work on in the future, and that's guiding the user (certain types of user): people who are used to playing video games have no trouble understanding the experience, whereas people who don't play much had a lot of trouble understanding what to do.

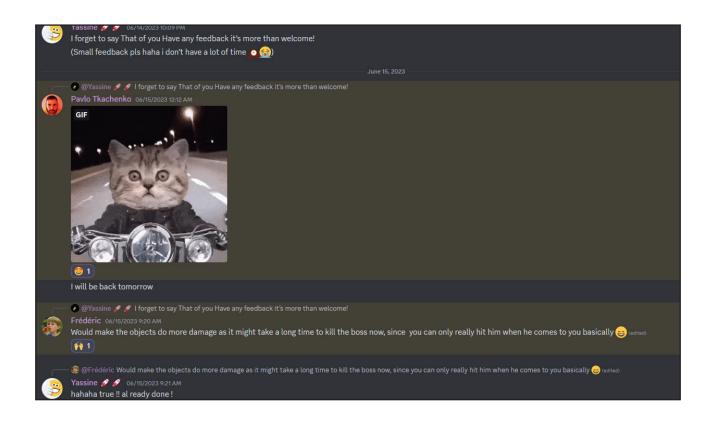
I've also shown videos of my experience to developers on discord, whether they be from Playar or Niantic Lightship, or even Loak AR games, who have helped me a lot with crucial feedback to improve my experience! (you can find this feedback in the appendix).











THE HELP I WAS ABLE TO FIND

To be sure that the technology I wanted to use is able to make the creation of the application possible I asked the question on the Lightship discord (the technology I will use for my project).

AR APP NAME BRAINSTORMING

Short description of the project: The application is an augmented reality application that offers a location-based AR experience. When you are present at the Kaai campus of the school you can start an AR experience that brings the campus to life with 3D/2D elements but also by allowing the buildings and different real objects to move

To find the name of my application I asked my work mates to help me to find a name and I received several propositions. (I work in an advertising agency specialised in augmented reality).

Below you will find a brainstorming of names proposed by me and my colleagues: Names:

Hidden Campus Life
Campus Cruiser
CampusExplorer360
CampusOmmersion3D
Campus Alive
Campus 360
Campus Virtual Adventure
Campus Alive 3D

CampusXplore3D CampusVirtTour

CampusAR EduAR SchoolAR CampusXplore

Campus Alive AR LiveCampusAR CampusLiveAR

Campus Xplore Alive XploreLiveCampus

Living Campus

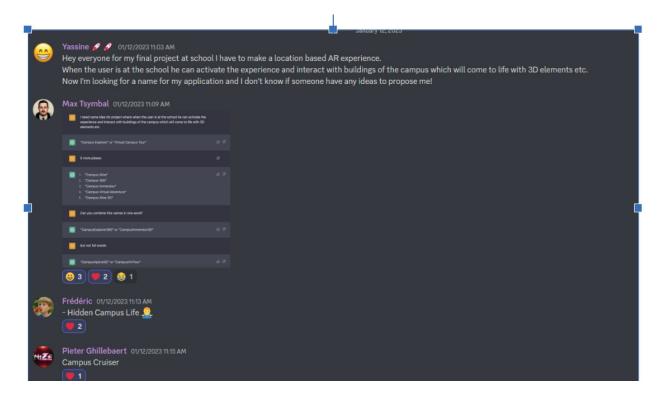
Camplife
Campyou
ScholAR
Visitar
CNOW (campus now & know in one ;))
Study Verse
Connectar
Student Reality
Playground
On the grid
Camplify

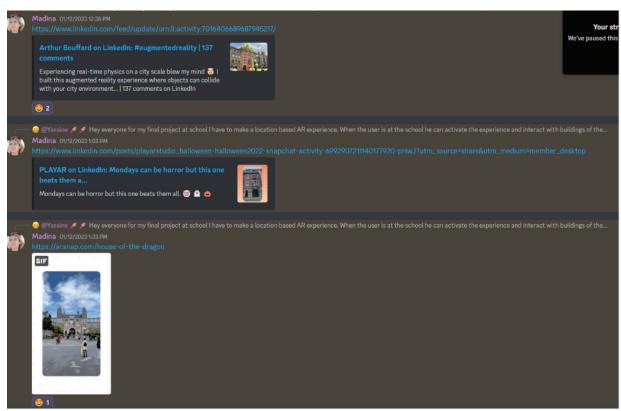
TOP 3

CampusXplore Alive +21

Campus Alive AR +14

XploreLiveCampus. +11





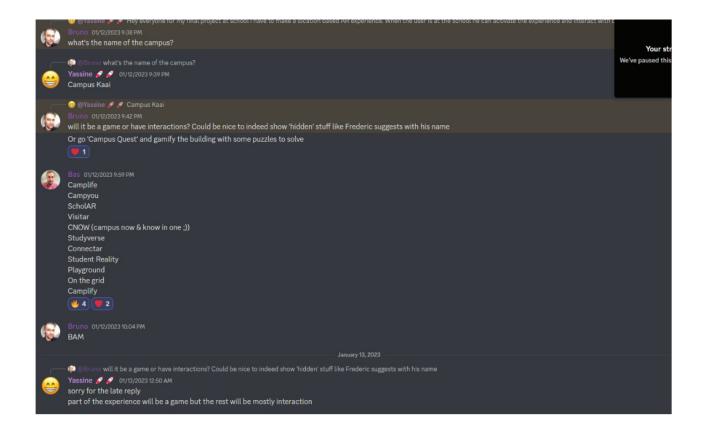


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