ASTRO ODYSSEY **BEYOND THE LIMITS OF PHYSICAL SPACE**. AN EDUCATIONAL CINEMATIC PIECE BY MARGARIDA BELO





CONCEPT INTRO

"Astro Odyssey" is an innovative educational initiative designed to engage students in an immersive cinematic experience that takes them on a mesmerising journey through the vast expanse of the universe. Utilizing Virtual Reality, the experience combines stunning visuals, captivating storytelling, and interactive elements to foster a deep understanding of astronomy and celestial phenomena.





CONCEPT - CONTINUATION

- This experience will consist of three main lectures that will be audibly prerecorded.
- I have decided to tackle the following themes:
 - Mars Exploration
- The Solar System
- Black Holes •
- I thought these 3 themes could bring insight to something familiar to most people. As more well-known astronomical concepts, I believe it can be an inspiring introduction to space-related studies. On the other hand, the Black Hole lecture is a bit intense and may present more complex ideas. However, I believe it is a wonderful way to finish this piece. As a subject of continuous scientific conundrum, it has a more captivating appeal to it. Therefore, it can serve as a way to inspire the viewer and to foment curiosity for astronomy and the cosmos.



RESEARCH AND CASE STUDIES

My concept is based on the research I am currently conducting for my dissertation. It focuses on the cinematographic experiences within Virtual Reality and its impact on students' engagement and focus during class. My Final Major project will be a direct exploration of this idea, transforming those conceptual assumptions into a product that I can better postulate and directly test on students.

RESEARCH AND CASE STUDIES -EXAMPLE 1

Recent studies have discussed the status of the education system in what the authors describe as the 4th Industrial Revolution. A paper by Grinshkun and Osipovskaya (2020) examines the impact of the economic and ideological consequences on the Russian education system, while simultaneously creating an overview of emerging technologies and skills that may lead to an entirely new education model. Similarly, Shahroom • and Hussin (2018) provide the readers with an overview of the challenges that students face in keeping up with such a fast-paced industry, while also trying to tackle a growing lack of focus among students.

Through this analysis, I was able to get a better perspective of the current educational paradigm shift, as well as the issues that arise. For instance, diminished focus. It also helped me find reasons for implementing my idea in VR, which as an emerging technology, has a relevant place within the future of education in the Fourth Industrial Revolution.

Links: https://ceur-ws.org/Vol-2770/paper2.pdf https://hrmars.com/index.php/IJARBSS/article/view/4593/Industrial-Revolution-40-and-Education-





RESEARCH AND CASE STUDIES -EXAMPLE 2

- VR has shown tremendous potential in educating and rehabilitating children (ages 18 and below) with multiple case studies that have tested the efficacy of VR on participants ranging in age, and gender As a goal, this comprehensive analysis intended to further explore the potential of VR in addressing education.
- students.
- Links: https://karger.com/ned/article/36/1/2/226406/Virtual-Reality-in-Pediatric-Neurorehabilitation

neurodevelopmental disorders. A study by Wang and Reid (2011) explores the use of this technology, examining disorder. These hypotheses were tested for Attention. Deficit Hyperactivity Disorder, Autism and Cerebral Palsy. neurological impairments in children and contribute to a better understating of its future implications in VR •

This paper was a valuable resource in evaluating education within different neurodevelopmental spectrums. As a result, it provided me with a crucial perspective on VR education that accounts for other perspectives aside from those of neurotypical folk. This could help me develop a more accessible experience across a spectrum of



RESEARCH AND CASE STUDIES -EXAMPLE 3

When addressing filmmaking, the impact of cinematographic practices can vary considerably based on the medium used to guide the spectator's gaze. For one, in VR, since the viewer has complete agency over where to look throughout the experience, cinematographic principles cannot be applied the same way as in 2D screens. Although these practices may remain the same in terms of taxonomy, the methods used to apply them as a way of diverting attention within Cinematic Virtual Reality (CVR) change completely. This is due to the viewer's agency and the use of 3D immersive environments that enforce the existence of another spatial dimension, making it a physical experience. This paired with the existence of multiple points of interest (POI) influences the viewer's ability to fully absorb the contents of immersive cinematic pieces. Therefore, the focus lies on finding the methods that allow the creators to direct focus. Further research by Rothe, Buschek and Hußmann(2019), demonstrates some of the methods proposed, with novel approaches that address the processes within CVR.

Links: <u>https://www.mdpi.com/2414-4088/3/1/19</u>

THOUGHT PROCESS - WHY ASTRONOMY?

Astronomy offers a distinct opportunity for students to experience the wonders of the universe in a way that is unattainable through other academic subjects. Unlike history, which surrounds us in the form of monuments and artefacts, or science, which is observable in our daily lives, the vastness and complexity of space remain largely inaccessible to most people. By creating an immersive educational experience in astronomy, I aim to bridge this gap, enabling students to embark on a captivating journey through space, exploring celestial corps and phenomena that are beyond the reach of conventional human experience.



WHY VR?

On the other hand, VR offers an unmatched immersive experience, enabling participants to explore the depths of space in a way that surpasses traditional educational methods. By simulating the vastness of the universe, VR fosters a profound engagement with celestial phenomena, providing a unique perspective that would be unattainable otherwise.



STORYBOARD





option one - learning about the solar system unhers done, back to scene 3



When done, but to seeme 3

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Page:

When doine, buch to scene 3

Miro link: <u>https://miro.com/app/board/uXjVNaoTtDo=/?share_link_id=75643151616</u>





FLOW CHART



Scenes/Lectures



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INSPIRATION





Education in the Metaverse - UI



Hyper-Reality - UI



Noun Town – learning gamification

Interstellar - Visuals



Gravity – Visuals and Immersion



Human Anatomy VR – Easy access to intricate resources



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INSPIRATION 2 – AI GENERATED IMAGES BY CANVA AI



Space Images Prompt – futuristic spaceship with view of space and a table with blue planet holograms in 1st person view

This futuristic classroom represents a scene that I will not be using anymore but it's still a good reference.

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Futuristic classroom Images Prompt – futuristic classroom in light tones with natural elements and nature

Classroom Image Prompt – Boring normal-looking classroom

THE TEACHER.

The teacher will be the only other character besides the viewer throughout the experience. They will be the main connection between the audio dialogue and the viewer's perception of the narrative.

At first, it will match the traditional classroom scene, meaning it needs to be human. After transitioning to the space scenes, the character will switch to a humanoid robot to once again, strengthen the paradigm shift in education, and also simulate a yetto-be-seen reality where robots could be as human-like as possible.

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THE UI

All throughout the experience, the viewer will have access to UI that will help enhance learning support in each scenario.

This will be accomplished through a menu bar where the student will be able to choose a variety of options that will pop up in front of their eyes. These could include picture taking, sending messages to classmates, data visualisation on the subject being studied, etc.

In terms of aesthetics, I was looking to create something more user-directed and less coherent to the overall aesthetic of the experience. Perhaps something that feels more like a smartphone menu. Meaning, modern, easy to comprehend and access.

Images taken from the video "Education in the Metaverse" ·

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SOFTWARE OVERVIEW

Rokoko

Metahuman

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Unreal Engine

and sketchfab.

Blender

Blender has already been used for my first prototypes in creating Saturn's rings (see prototype videos below for better reference). However, I will not be using it extensively. Only when certain minimal elements require me to do so. I'll get most of my

assets from free platforms such as the Unreal Library

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be used briefly since it will switch to a robot from the second scene onwards.

Metahuman

Mentioning this software is the perfect introduction for my only other character in the scene, the teacher. Which at first will be human. Therefore, Metahuman will be the perfect software to create a more detailed and personalised character. However, as mentioned above, this character will only

As I have also mentioned in the Teacher character slide, I will be using motion capture to get the movement of the teacher through

acting instead of animation, since it's too time-consuming and looks less realistic.

Furthermore, it will provide me with smoother transitions and better dialogue-to-movement coherence since the actor will be able to correspond the pre-recorded audio lectures to more realistic character movements.

Rokoko

Finally, Unreal Engine. I think this one speaks for itself. As the main platform I'll be using for the entire experience's development and assets incorporation, it represents my most valuable and central tool for this Final Major Project.

Unreal Engine

TIMELINE AND MILESTONES

November 1st Submission

January Project Development and testing

December

Winter Break – find a team Project Development and to collaborate with

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March

Spring Break - Project Development and testing

February testing

April

 Testing and feedback + Final submission

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December Aka winter break

NĖXT STEPS...

The next steps will mostly consist of experimenting. Since I'll be working with new software (unreal),

I'll most definitely encounter challenges that I want to be aware of now.

- Finding a team to work with;
- Create Mars Scene through "Valley of the Ancient" package(contains texture and terrain assets I need);
- Create "normal" classroom scene (see inspiration);
 - Do some camera-based motion capture testing;
 - Fix VR support (see prototype page)

ValleyoftheAncient

COLLABORATIONS AND TASK DISTRIBUTION

Sound Production

Lectures' develo

Unreal developn

Motion Capture

UI/UX Design

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on •	Sound Arts Student	• Vacant •
pment	Astronomy student/Speciali st/Teacher	• Vacant •
nent •	Me	Taken (obviously
Acting	Acting Student	Vacant (But alread got a candidate)
	UI/UX Design Student	Vacant ·

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PROTOTYPES .

Prototype – overview

Prototype – play mode on PC

VR support still has a lot of issues. It keeps lagging in play mode (in the headset) and I can't teleport in this mode. I'll be fixing these issues over winter break and try to find better solutions for an overall smoother experience.

THANK YOU ③