

***Interactive Methods for Immersive Theater through Augmented Reality*** - (White Paper)

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## INTRODUCTION

Virtual, augmented, and extended reality are becoming more popular in education, although it is still frequently used as a distinct experience that is challenging to incorporate into traditional teaching methods. Although educational institutions are using digital technologies, the knowledge transferred about digital subjects in the theater typically focuses on supplementary topics like visualization methods and 3D representations. There are presently very seldom teaching initiatives on immersive technologies in theaters.

## BACKGROUND:

Extended Reality, commonly referred to as XR, is an umbrella term used for studio environments created using Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR) techniques.

1. VR: Virtual Reality - Virtual reality uses computer technology to create a simulated environment for the user to inhabit. The most common part is the head-mounted display (HMD), which gives users access to a virtual environment with sound and vision and lets them walk about and interact with items while linked to a console or PC.
2. AR: Augmented Reality - Utilizing technology, augmented reality adds new levels of perception to the user's experience by projecting digital data onto a real-world environment. The use of QR codes, which are scanned to open content on mobile devices, is one of the most prevalent ways that AR is used in daily life.
3. MR: Mixed Reality - The actual world and the virtual world merge in mixed reality. The user engages in physical and virtual world interaction and manipulation. The user can

experience a mixed environment using next-generation sensing and imaging technology by combining VR and AR.

Although the video game industry and tech-savvy consumers now have the most access to virtual reality, this virtual world is still unable to establish itself as a platform for spectators to engage with linear tales, particularly theater. There have long been opportunities for successful interaction between the real world and virtual reality world. There are various journals, books, and essays on the subject of virtual reality, but few discuss how technology affects theater, let alone how an audience would react emotionally.

## PROBLEM STATEMENT

In the theatrical world, many rehearsals are limited to smaller groups rehearsing together due to the Covid-19 pandemic. Recently, many shows are still being cancelled due to Covid 19. Directors are trying to find easier socially distanced ways on how to rehearse their shows safely. Also, sets and props are rarely ever finished when rehearsals start. The sets and props are what is needed to help the performer and theatergoer understand the scene.

To support actors in this complicated task, the introduction of Virtual Reality for theatrical rehearsals and drama classes will take place. This will not only engage actors in the digital scenery but to provide them with advanced features for rehearsing their play and learning scene work/stage work in the theater classroom. The Virtual Reality world will combine an interactive environment with changeable scenarios that will feature to let performers rehearse dialogue and action at their own pace while becoming accustomed with the virtual aspects.

## PROPOSED SOLUTION

A theater school teacher stated in the Wall Street Journal, " If you don't see it, the audience won't see it". Virtual Reality tools will help to accompany actors in their scenes. While the interactive scenario allows actors to practice their play and prepare their language, the interactive environment allows actors to become familiar with the virtual setting and objects.

Given that I am a music theater instructor in the North Bergen School district, I have the decision on what shows my school can perform for the 2023-2024 year. My plans are to take a course on the platform Coursera called, "VR and 360 Video Production." This course will introduce me to Virtual Reality and 360 video production. I would like to learn the skills on how to make VR scenery environment.

The VR environment helps actors create a realistic mental representation of the virtual scenery and of their virtual partners in addition to giving them a sense of immersion. Once I learn how to design VR scenery environment, I can start figuring out what shows my school can perform for next year. I will then start designing the scenery in the VR world. I will then have to start thinking about which Virtual Reality goggles the school must purchase for this plan.

Rehearsals for virtual reality theater will depend on two key components. Both the environment and the scenario will be interactive. Actors can easily interact with both virtual characters and environment items thanks to the fully interactive environment. The interactive scenario enables user-driven activities to be coordinated with scenario-driven actions. Instead than worrying about the timing of the animations, actors may concentrate on their acting and language.

For my theater classes, I will need twelve VR headsets. Due to the ease with which headsets may be cleaned and exchanged, this figure is decreased. Oculus Rift S, HTC VIVE Pro 2, Oculus Quest 1 and 2, Microsoft HoloLens, and Samsung Gear are among the available headgear. The typical price range for these headsets is \$399 to \$1200, plus shipping costs. I have the option of ordering these goggles through my yearly requisition or a grant.

My next goal is to find out write a grant for help in implementing VR goggles in my theater classroom. I am starting to search and get information on Classvr.com ([www.classvr.com](http://www.classvr.com)). I will learn how to write proper grants and start sending them out. I will also request the given number of VR goggles in my school requisition in May 2023.

## CONCLUSION

One of the companies that is most identified with the genre is “Magic Leap”, founded by the former Israeli citizen Rony Abovitz, which holds a develop center in Israel. The company raised 1.4 billion dollars, according to the value of 4.5 billion dollars from strong companies in the Silicon Valley, such as Google, which considers it to be its wing of Augmented Reality, the Chinese company Alibaba and the Andreessen Horowitz Fund. Magic Leap has been spreading promises for several years now about a very ambitious product its developing and is gaining vast coverage for it – a technology that will allow to combine virtual objects in the actual space, by transmitting a digital light-field, captured by the eye, the same way the eye can notice analogical

objects. That being said, outside the company's walls, very few have had the privilege to witness the technology with their own eyes.

Apple, which is looking for a groundbreaking device to inherit the iPhone, presents plans according to which the technology to produce Augmented Reality goggles will be ready on 2019, and that the first product will see the market on 2020. Tim Cook, sees Augmented Reality as a less isolating technology than Virtual Reality, and with a serious potential to be as revolutionary as the smartphone. Speaking to analysts while publishing the last quarterly report, Cook dedicated to this subject almost the same amount of time he dedicated to the increase in sales. "We can already see the things that will change the way in which you work, play and learn", He said. "We believe that Augmented Reality is about to change forever the way we use technology".

## BACKGROUND

### SOLUTION –

<https://account.altvr.com/channels/EducatorsVR>

Educators in Virtual Reality is an international membership and educational organization offering training, consultation services and supports 25 special interest groups called Teams. These teams explore the diverse niches in the XR industry including aviation and flight training, language learning, homeschooling, virtual hardware, theatre performance and production, medical and healthcare, world building, and XR business.

Educators in Virtual Reality (EDVR) hosts and produces over 800 Virtual Reality events in AltspaceVR and across the metaverse connecting educators, students, researchers, trainers, and businesses with the power of immersive education.

Their annual conference is the Educators in VR UniVirtual Experience, a free, must-attend event for those exploring immersive education.

## CONCLUSION

<http://www.arshowpro.com/they-said-weve-gone-mad-that-augmented-reality-is-for-pokemon-go-not-for-theater/>

### Links

Report: [www.cs.helsinki.fi/u/laster/2013/fall/AR/laster\\_larpcaster.pdf](http://www.cs.helsinki.fi/u/laster/2013/fall/AR/laster_larpcaster.pdf)

Slides: [www.cs.helsinki.fi/u/laster/2013/fall/AR/laster\\_larpcaster\\_presentation.pdf](http://www.cs.helsinki.fi/u/laster/2013/fall/AR/laster_larpcaster_presentation.pdf)

Prototype: [www.cs.helsinki.fi/u/laster/2013/fall/AR/larpcaster.apk](http://www.cs.helsinki.fi/u/laster/2013/fall/AR/larpcaster.apk)

13th Lab.

Pointcloud.

[Online; accessed 03-October-2013; <http://pointcloud.io>].

Björk, S., Falk, J., Hansson, R., and Ljungstrand, P. (2001).  
Pirates! using the physical world as a game board.  
In *PROCEEDINGS OF INTERACT 2001*, pages 9–13.

Herling, J. and Broll, W. (2010).

Advanced self-contained object removal for realizing real-time diminished reality in unconstrained environments. In *Mixed and Augmented Reality (ISMAR), 2010 9th IEEE International Symposium on*, pages 207–212.

Klein, G. and Murray, D. (2007).

Parallel tracking and mapping for small AR workspaces.

In *Proc. Sixth IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR'07)*, Nara, Japan.

Sachs, D. (2010).

Sensor fusion on android devices: A revolution in motion processing.  
[Online; accessed 03-October-2013; <http://www.youtube.com/watch?v=C7JQ7Rpwn2k>].

Shala, U. and Rodriguez, A. (2011).

Indoor positioning using sensor-fusion in Android devices. PhD thesis, Kristianstad University, Sweden.

Wetzel, R., McCall, R., Braun, A.-K., and Broll, W. (2008).  
Guidelines for designing augmented reality games.  
In *Proceedings of the 2008 Conference on Future Play: Research, Play, Share, Future Play '08*, pages 173–180, New York, NY, USA. ACM.

[https://www.cs.helsinki.fi/u/laster/2013/fall/AR/laster\\_larpcaster\\_presentation.pdf](https://www.cs.helsinki.fi/u/laster/2013/fall/AR/laster_larpcaster_presentation.pdf)

## Resources

**Bucher, John.** *Storytelling for Virtual Reality: Methods and Principles for Crafting Immersive Narratives.* New York, NY: Routledge, 2018.

**The Imagineers.** *The Imagineering Field Guide to Disneyland: An Imagineer's-Eye Tour.* New York, NY: Disney Enterprises, 2008.

<https://learningsolutionsmag.com/articles/xr-elearning-experiences-adapting-immersive-theater-methods>