



**Student  
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**Virtual Space**  
Assignment 01  
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# CONCEPT PROPOSAL

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**This Document**

A proposal for a new educational  
virtual space known as MDVR

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**Notice of Plagiarism**

The ideas expressed in this documents are that of my own, any  
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## ABOUT MDVR

This program will allow performers to rehearse at any time, even when they're alone.

### THE PROBLEM

The human brain can remember only 20% of what we hear, yet every day we subconsciously hum our favourite songs, but because we also remember 30% of what we see, we begin to easily quote and reenact scenes from films we love, incredibly, however, we can remember up to 90% of things we do, which is why rehearsal time is so important for performers. Being able to see, hear and experience other actors close up is key to a successful performance, but organising rehearsal time is difficult and expensive, so for many amateur dramatics societies, weekly or fortnightly rehearsals are all they can manage, the rest of a performers time revolves around looking through script and notes.

### THE SOLUTION

I propose MDVR (Musical Director Virtual Reality) a virtual space created in Unreal Engine 4 in which musical numbers from shows can be viewed using a virtual reality headset, 3D representations of the actors will appear and perform the numbers complete with choreography and harmonies. The user can move around the space to watch the performance from any angle, and they can hear each actor close up, they also have the choice to "pilot" an actor and see from that character's point of view. When piloting that actor, their audio is muted so the performer can sing along with the other "actors", the performer can use this program alone or connect to the internet and perform with other real-life actors. If a performer has access to live motion capture software they can control the actor that they are piloting, if not the actor will move on it's own.

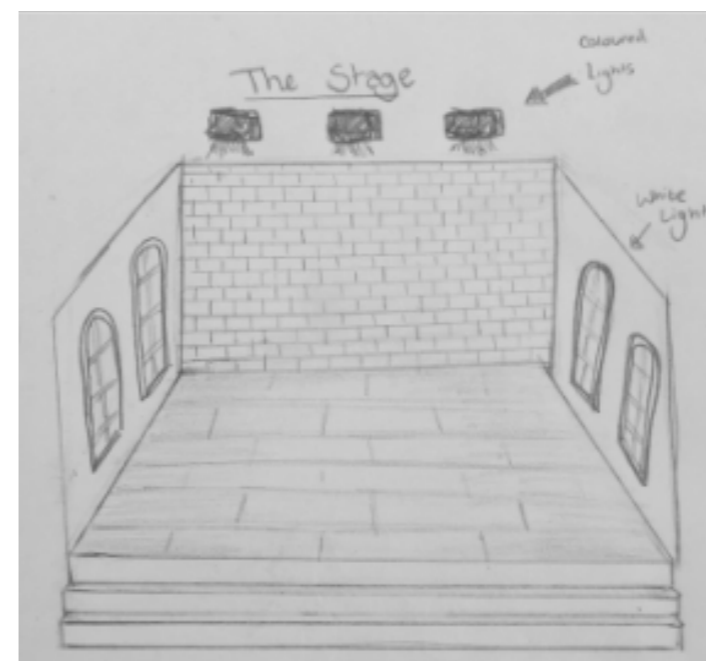
### THE TARGET AUDIENCE

Many amateur performers want to put on shows, but don't have a musical director, licensing companies such as Josef Weinberger offer programs such as RehearScore where you can play each harmony and instrument through for rehearsal purposes, making the need for an 'MD' unnecessary - if a company doesn't have a director, however, there is not a program available to tell the actors what to do. This program takes RehearScore to the next level, allowing actors to have an entire show organised for them.

### THE PROGRAM

Each version of the program will be tailored to the specific show that the customer will be performing. but they will all follow the same basic outline, a stage, a scene selection menu etc. this program will be "rented" when a drama society purchases the rights for a show. The company can also decide to rent other materials such as microphones, leap motion sensors, or perception neuron suits for performers who want the full experience.

## THE SETTING



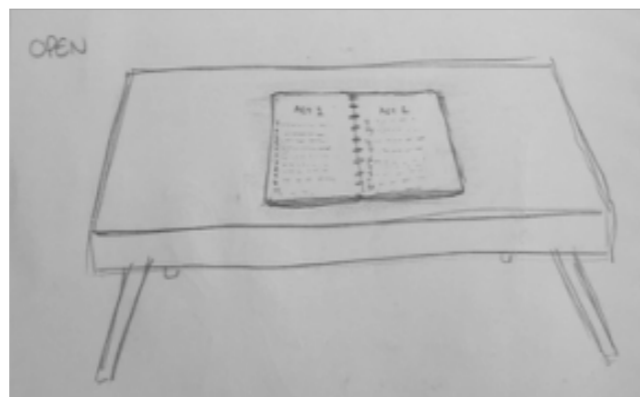
It is an open performance space, a suggested set design dresses an otherwise blank stage. Above the stage there are lighting rigs that can be mimicked in an amateur theatre, a few metres forward of the stage is a table, a script, and a director's chair, this is where you will be placed when you start the VR experience.



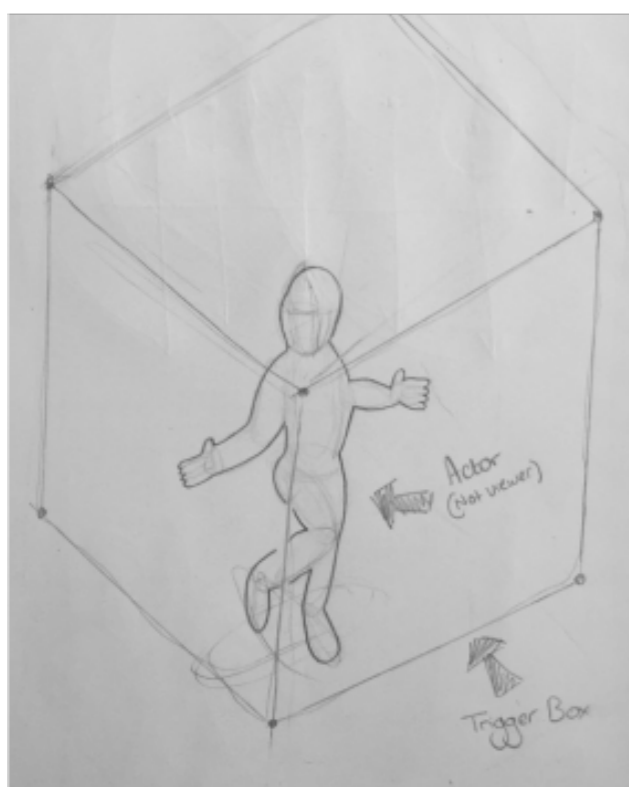
## SCENE SELECTION



This program is intended to be rented along with licensing of the show, so as you look down you see a libretto with the title of the show and the performance license information written on the front.



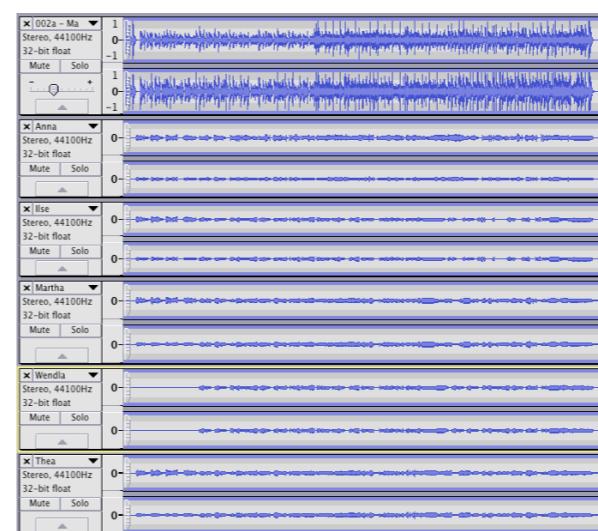
When selected, the book opens and you can choose musical numbers from either act. Once the scene is chosen, the book will turn to the correct page and the scene will play out on the stage in front of you whilst the script highlights the lyrics, dialogue and stage directions.



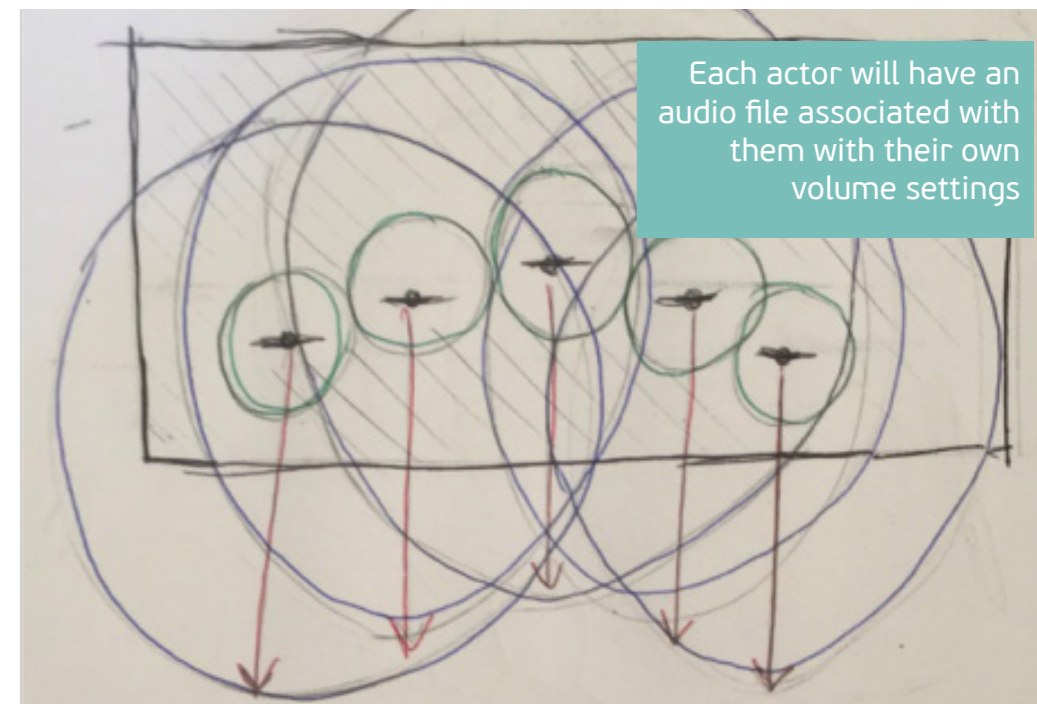
## ACTOR CIRCLES

Each actor has an "actor's circle", this is a trigger box that gives the viewer certain options such as "solo mode" or "pilot actor" to see through their eyes. These circles are invisible but settings can be applied so we see a translucent version of the actor circle if desired, VR headsets don't have complete peripheral vision capabilities so this allows the user to see when they're too close to another actor.

## AUDIO / STAGING



The backing music will play out loud with no fall off, each actor has a WAV file of their harmony attached to them. As you approach each actor you can hear them more clearly, if you enter an actor's circle you can choose to go "solo mode", this will add a low-pass filter to the other harmonies so you can hear each the one you want, imitating the feeling a performer has when they're focussing on their own performance. The audio will be directional, so you can understand how the choreography will affect the way the actors will be heard. You can also mute any character you like, this allows you to sing their part, this also automatically happens when you choose to pilot an actor.







## MOCAP

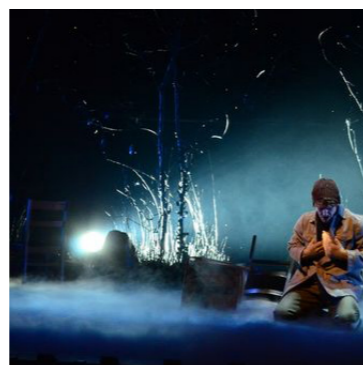
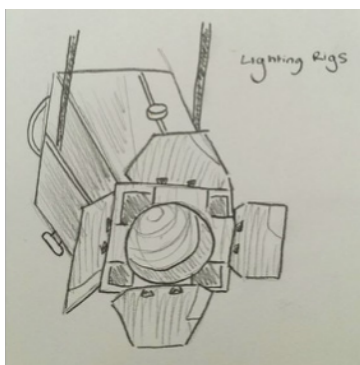
Motion capture software will be used to create animation for the choreography, this will be captured using three Playstation EyeToy cameras and the software will be iPi. Preferably, full body 3D scanning would be used to import a likeness of the user into the program, until then there will be a selection of 3D models to choose from designed to the likeness of the characters, this way the proportions will be the same as the motion capture data.

## LIGHTING

The scenes will have visible lighting rigs, there won't be any unidentifiable light sources, this way the performers know how to set up the lights in the theatre, not having to rely on a tech team to design lighting rigs. The lighting will attempt to imitate real stage lighting as much as possible so that there aren't any in-engine lighting rigs that set unattainable standards for the people trying to imitate them.

## DESIGN

When the user approaches different parts of the set they can choose to see information about how the stage is built. If the player is using leap motion, they can point at anything in the scene and it will be highlighted, if they "tap" on the object a menu will appear with information, this could be a description of the object, the vocal range of a character, or even technical information on how lighting or sound is achieved.

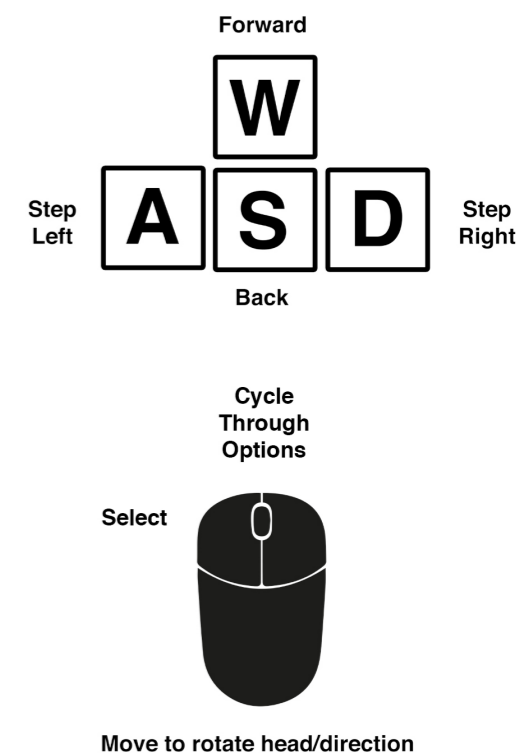


# CONTROLS

MDVR will be functional with many different types of controllers, the first two options are either a mouse and keyboard, or using a wireless gamepad, when using the mouse and keyboard, the user is a spectator because they are restricted to a desk, whilst a wireless gamepad allows for movement.

## KEYBOARD AND MOUSE

- The user moves using the WASD keys
- The user can move the camera 80 degrees in any direction by moving the mouse in the corresponding direction, when moving with WASD moving the mouse will also change the direction of the character
- Left clicking will select something that is currently being looked at
- Using the mouse wheel the user can cycle through options quickly, such as scene selection, the option will be temporarily highlighted and clicking the left mouse button will select
- The space bar will pause any action in the scene





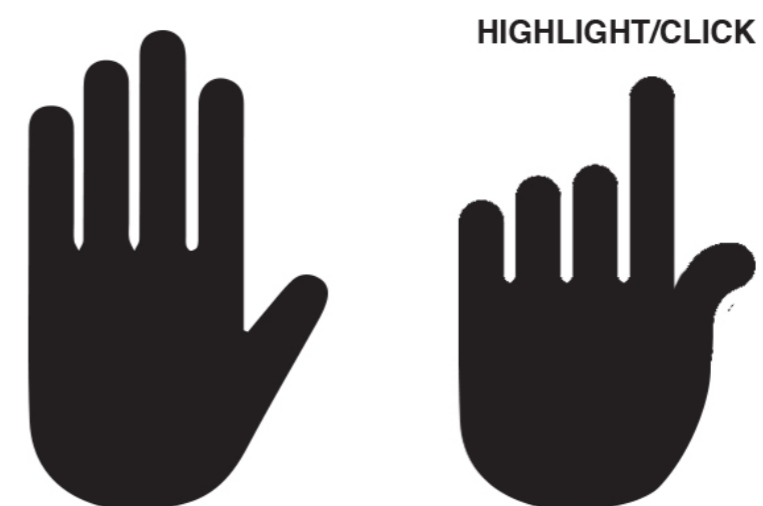
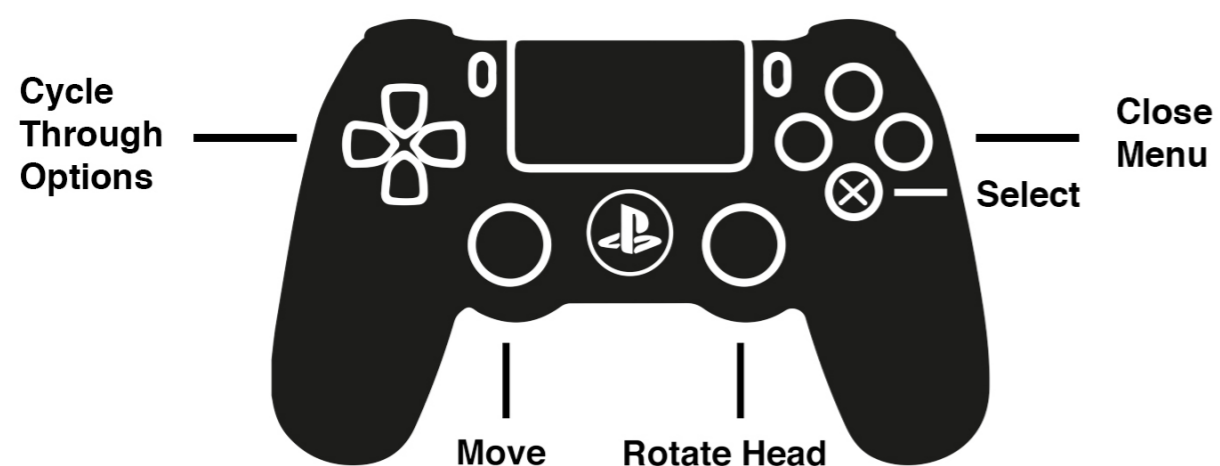
## GAMEPAD

- The user moves using the the left analogue stick
- The player can move the camera 80 degrees in any direction by using the right analogue stick, when moving your character the right analogue stick will also change the direction of the character
- The X button will select something that is currently being looked at
- Using the d-pad, the user can cycle through options quickly, such as scene selection.
- B will close a menu
- Start will pause any action on the stage

For the user to get a more immersive experience they will need to make use of live motion capture, it is recommended to use MDVR with Leap Motion as one of the main "tasks" in the simulation is to flick through a script, swiping left and right would turn the page, and a point and tap scheme would then be used to select scenes and songs.

## LEAP MOTION

- Clenching your hand into fists will control movement
- Right/Left fist only will turn your character
- Two fists and forward/backward will move forward/backward
- Pointing at an object will highlight it
- Tapping at it will select it
- Turning your palms toward your face will open a keyboard
- Facing one palm away from your face will pause the scene

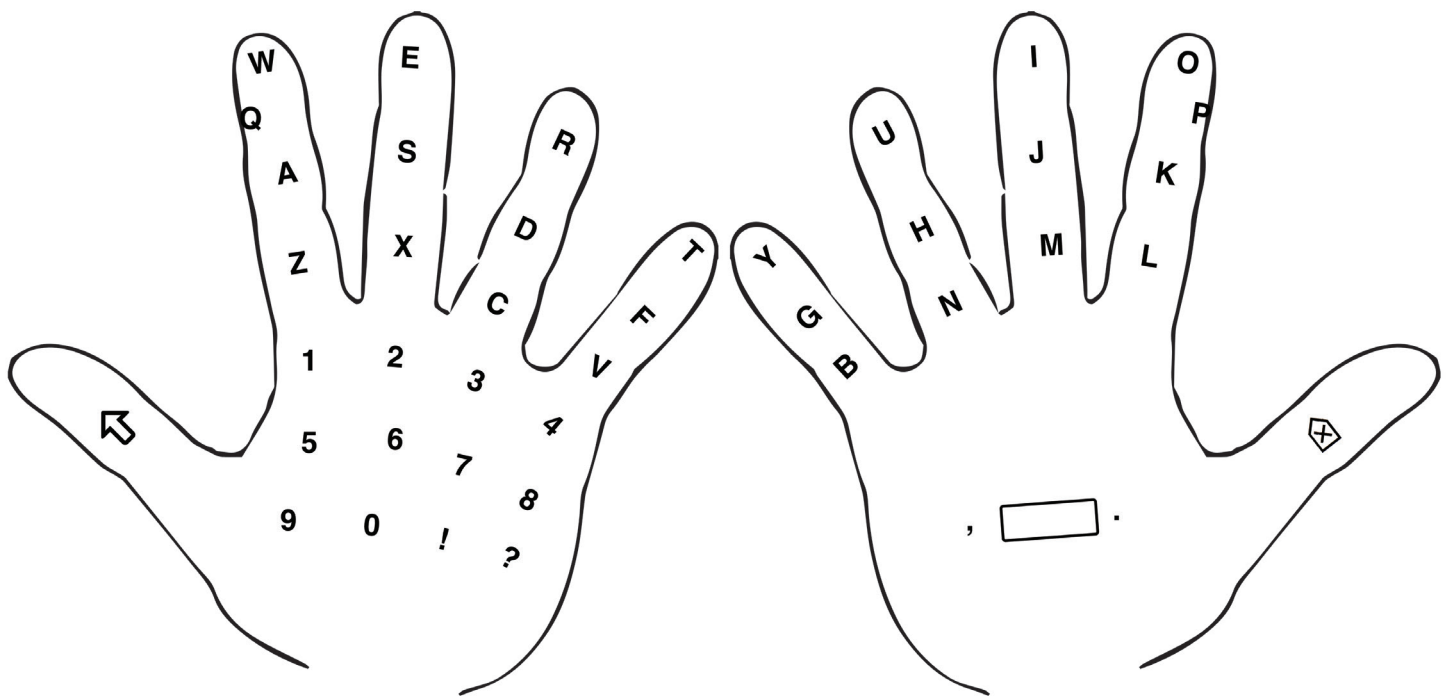




As this program relies heavily on being able to hear, it allows for both the use of your voice and an “Augmented Reality Hand Keyboard” for communication, that way performers can sing uninterrupted whilst other cast members discuss or give feedback in text form.

### AR HAND KEYBOARD

- Turn your hands toward the leap motion detector to bring up the keyboard
- Quickly opening and closing your palms will show extra characters
- Turning both hands away from the screen will remove the keyboard



If performers have access to a large dedicated space they can rent perception neuron suits along with the program, this will allow them to completely control their 3D counterparts to rehearse both singing and choreography.