

# Creating a Virtual Environment for Small Scale Productions

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## Introduction:

This project looked to bring the functionality of virtual environments to a low budget production like individually ran live streams by creating a virtual studio. Solo ran live streams on websites like Twitch.com have become extremely popular in recent years with on average 3,161,169 viewers on the site at anyone time in 2021. (TwitchTracker, 2021) Most streams are a creators with gameplay and a webcam which leaves a lot of room to improve the production value on these extremely popular content. Another type of production that will benefit from a virtual studio is an Esports tournaments broadcast. Lots of the functionalities in the studio were tailored to an esports production.

## Aims:

- 1. Create a virtual environment to be used for the broadcast,
- 2. Make a set of features that will add production value to a broadcast (Including camera movements, scene changes and video inputs from online calls),
- 3. Create outputs to streaming software to be broadcasted to online platforms,
- 4. Set up real life camera set-up to be imported into the virtual environment,
- 5. Ensure the end product can be operated by a single operator,

## Results:

Through testing the studio NDI video signals originally did not give good results of picture quality and the audio was not synced to the video correctly. This problem was solved by using a clean network for the signal to be carried over and it yield much better results in the picture quality. Another problem that was identified in the testing was the user experience of operating the virtual studio with a conventional keyboard. An Elgato stream deck would be an ideal solution for this function but was not available in this project.(Elgato, 2021) Remote control of the studio was explored but the combinations of plugins caused problems for the beta remote system that was attempted to use. (Unreal Engine, 2020)

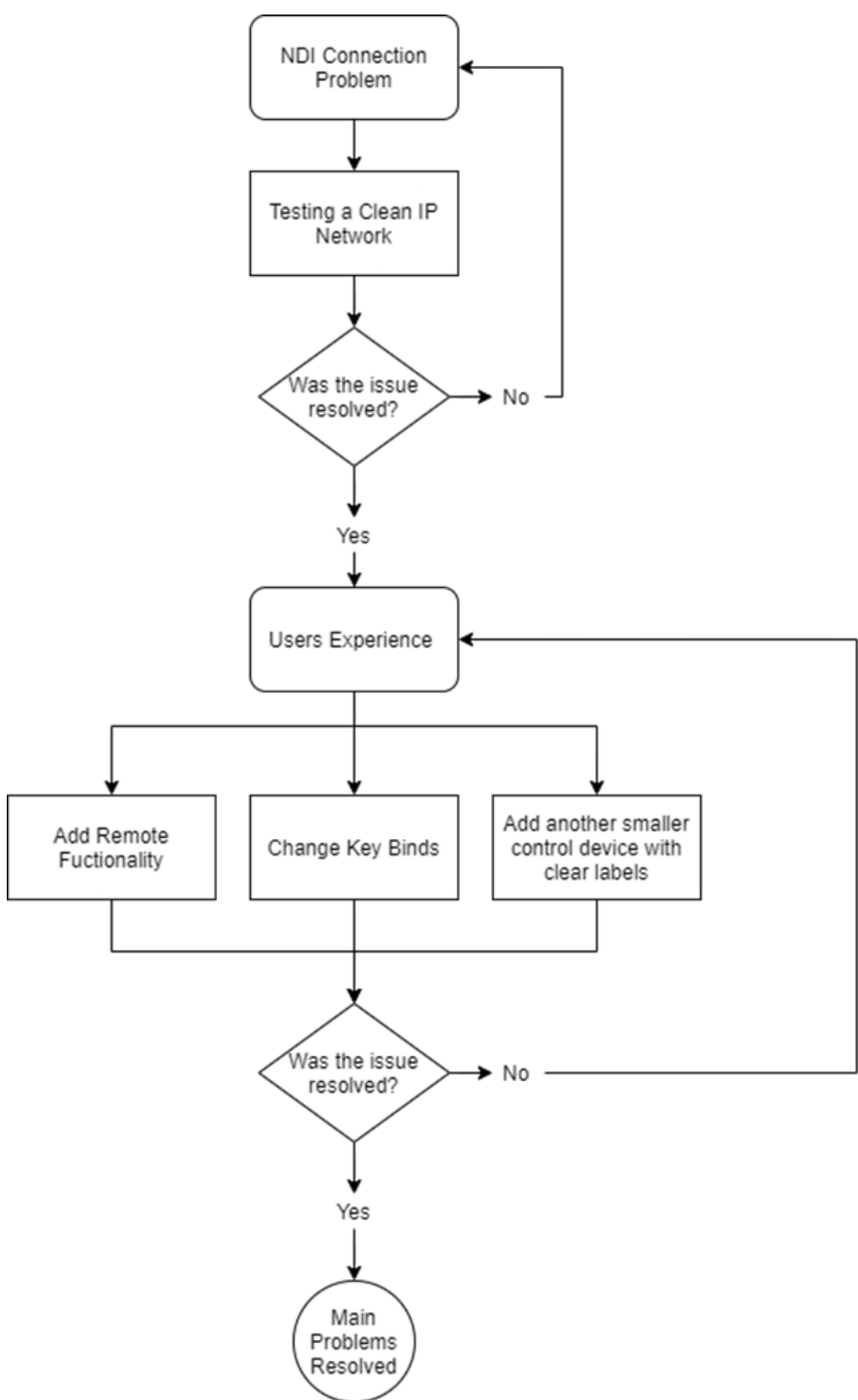


Figure 3: Final Improvements

## Method:

This project started by researching pre existing virtual studios at different price points to highlight the important features to have. These features were shown in aim 2. Unreal Engine 4 and OBS were used to create the solution. Through creating the studio many problems were found with video signal routing. NDI was used to used to input video signals into the studio including gameplay and guest cameras. Spout is a video transport system that is mostly used to traffic 3D models from software like Blender to another like Unreal Engine 4. In this solution Spout was used to output the Unreal Engine cameras into OBS to broadcast the studio onto Twitch.com. The solution was created to be used at a Counter Strike: Global Offensive Esports tournament for a small community called Mapcore.

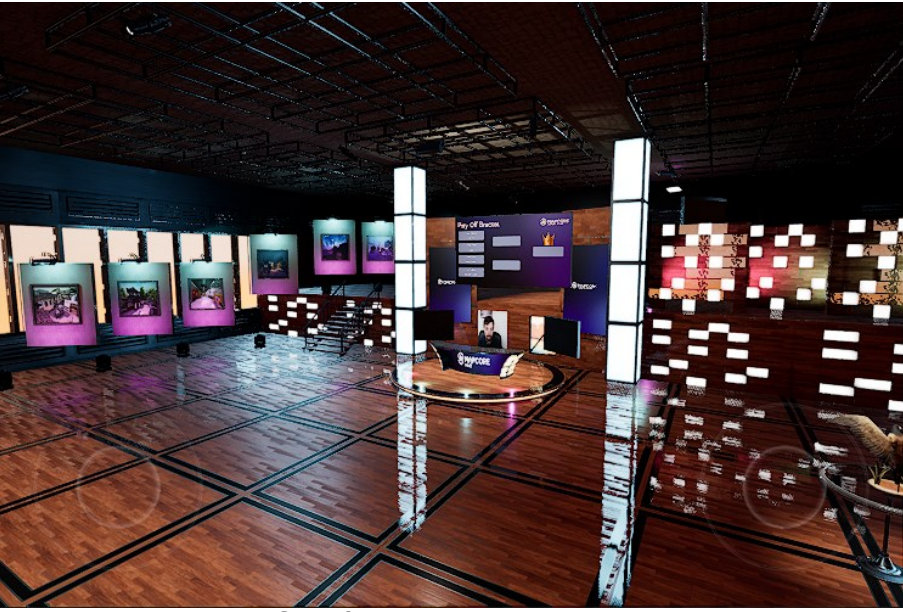


Figure 1: Main Studio



Figure 2: Caster Section

## Conclusion:

This project achieved objectives set out and created a virtual environments broadcasts can take place from. The final solution is functional and easy to operate but the set-up is difficult to fine tune. The studio can be used in any live stream through popular streaming platforms such as Twitch, YouTube or Facebook Live. The studio is well equipment for Esports production but can be adapted to any kind of broadcast required. The project management throughout has given consistent work on the project from January to April giving a good final solution.

## Reference:

Elgato, 2021. *STREAM DECK*. [Online]  
Available at: <https://www.elgato.com/en/stream-deck>  
TwitchTracker, 2021. *Twitch Statistics & charts*. [Online]  
Available at: <https://twitchtracker.com/statistics>  
Unreal Engine, 2020. *Remote Control Web Interface*. [Online]  
Available at: <https://docs.unrealengine.com/en-US/ProductionPipelines/ScriptingAndAutomation/WebControl/index.html>

## Studio Tour:

Taken just before the test event including:  
Casters,  
Camera Movements,  
Chroma Keying,  
Graphics.

