

Creating a real-time virtual production based on industry practices

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Abstract

This project aimed to create a small-scale real time virtual production based on current industry methods similar to the likes of Disney's The Mandalorian. To begin, an investigation into different production practices of large-scale LED virtual productions and camera tracking methods was made. This would provide a base understanding of how technology has advanced and been utilized to enable the creation of combined real and virtual worlds. As modern production techniques are shifting, this project set out to test the results of creating a modern virtual production with comparably rudimentary equipment compared to the high-level industry. From this, a result could be taken and compared to see how far it would need to be pushed in order to reach the highest production level quality.

Aims and Objectives

- Research and develop a system chain of tracking technology and software
- Explore methods and practical uses of combined technology
- Build and test technology to track real world objects into a graphics software

Results



Final live composite with altered camera view and real world subject.

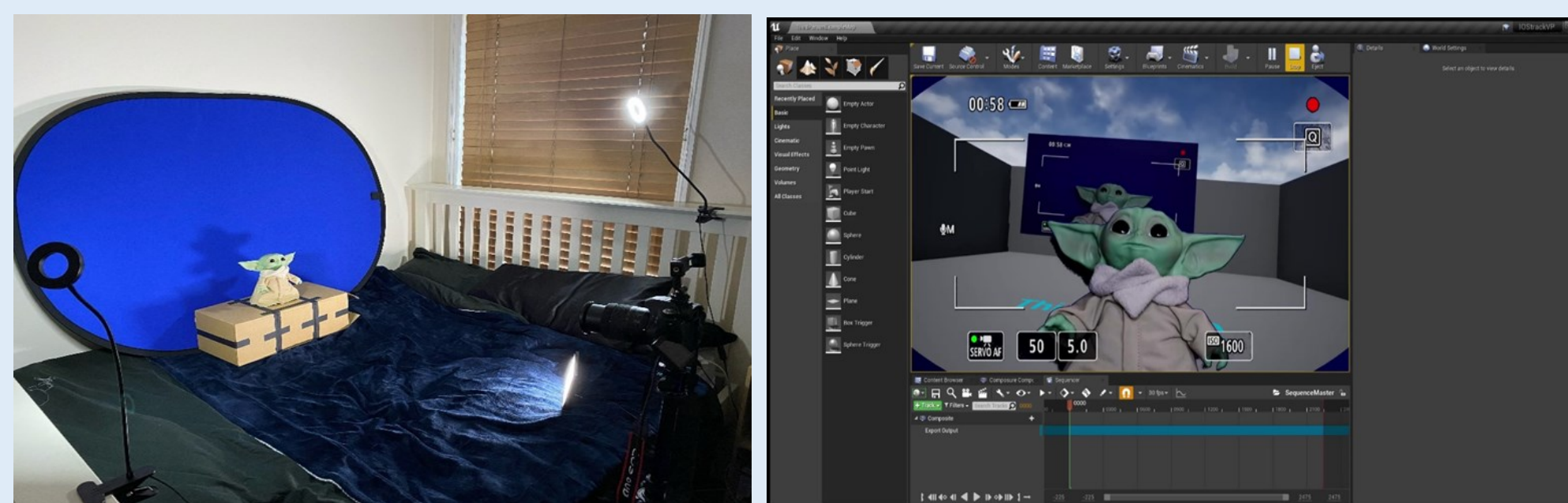
The results shown display a working virtual scene with a real world interaction using a live camera to control the frame and explore the scene while maintaining the subject within the world. The project shows an ability to enable productions methods similar to industry practices and could be improved and pushed forward with access to a larger range of physical and technical equipment and devices to enlarge the range of the project and produce more effective results.

Method

The hardware setup for virtual production is a Canon 80D mounted on a tripod. The camera is setup in live mode to be able to send a direct signal to the computer via a mini-HDMI cable and a HDMI to USB video adapter. The iPhone is mounted on top of the camera and is connected to the computer and Unreal engine using the Unreal remote 2 app over an IP connection.

The virtual camera plugin enables a Cine Camera which is a user created viewport in the virtual world that can receive remote inputs from an external device such as an iPhone. This element is what receives the position and rotational data from the iPhone being used as a virtual camera. (Epic Games n.d)

A composite is then made which will display the two inputs once they are joined and the keying is complete. Using unreal engine documentation the live input and virtual world are combined and the blue screen is keyed using a multi-pass chroma key. (Epic games n.d)



Conclusion

In Conclusion, the final result of the project has produced a small-scale virtual production using research of industry practices and proposed methods to influence the method of the final project. The use of blue screen and keying as a method to bring the virtual and real worlds together was adopted with the use of Unreal engine to further the accessibility to plugins. These would allow live camera feeds and motion tracking data to be sent into the engine over IP using an iPhone to create the production. While in early stages of the project different approached methods did not work for the in the proposed way, the adaption of exploring different related technology allowed for the discovery of an accessible method.

References

- EPIC GAMES, n.d. *Real-time compositing quick start* [viewed 12 May 2021]. Available from: <https://docs.unrealengine.com/en-US/WorkingWithMedia/Composure/QuickStart/index.html>
- EPIC GAMES, n.d. *Virtual camera plugin* [viewed 12 May 2021]. Available from: <https://docs.unrealengine.com/en-US/AnimatingObjects/VirtualCameraPlugin/index.html>