

Team 522: Tactile Virtual Camera Controller for Film Production

Weston Dudley • Kayla Miller • Keishon Smith • Kyle Suarez • Daniella Turbessi

Project Scope

This project is to design a user-friendly virtual camera controller that seamlessly couples the user to a virtual free space. We are assuming that the target audience, film students and cinematographers, have prior knowledge of topics related to cinematography of film. The main market we are targeting is film education. This will help future film students stay up-to-date with the industry standard.

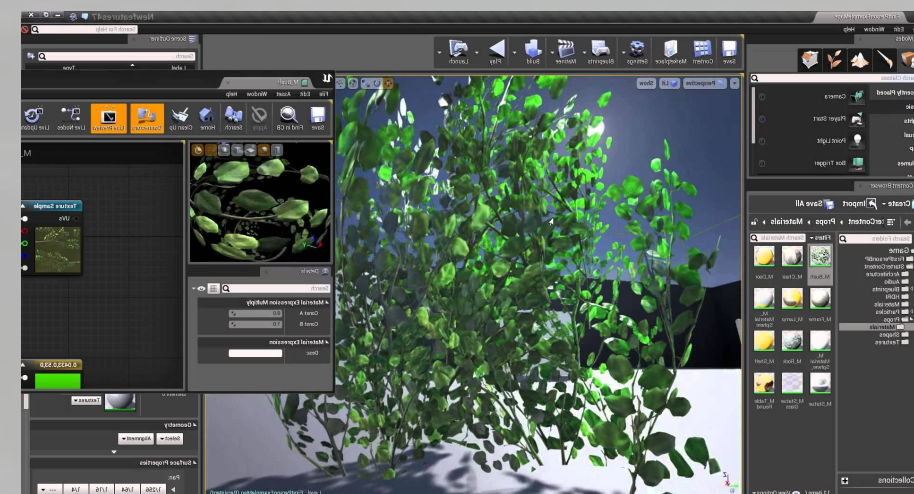
Background

Cinematography

- The film industry has seen huge growth in virtual production, film makers have had to adjust to working in these new environments.
- Doing so means having to build a bridge between man and machine that allows virtual and real to exist concurrently.

Unreal Engine 4 (UE4)

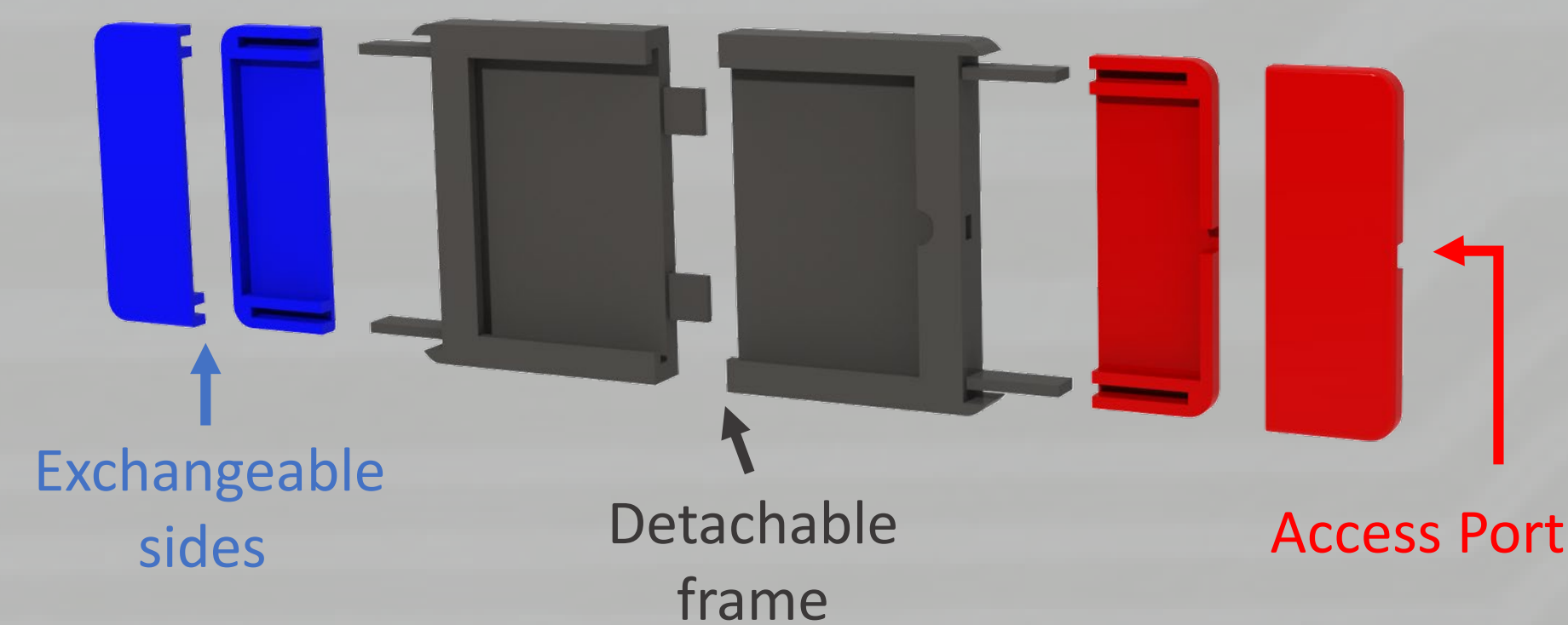
- UE4 is a widely used game engine, an environment designed for developing software for video games.
- This platform is also widely used for digital and effect artists working with Computer Generated Imagery (CGI) in film.
- For our project, we are focused on taking the powerful tools and applications of UE4 and make them easily accessible to cinematographers working in this field.



Targets

Function	Metric	Target
Position in the Virtual World	Navigate throughout the entire scope of the world	YES
Camera Lens Function	Lens Options (mm)	18, 25, 35, 50, 75, 100
Range	Range of communication between device and Unreal Engine	30
Latency	Time (ms)	67-100
Perform Several Tasks	Are there multiple features?	Record, footprint, camera placement, lens, playback

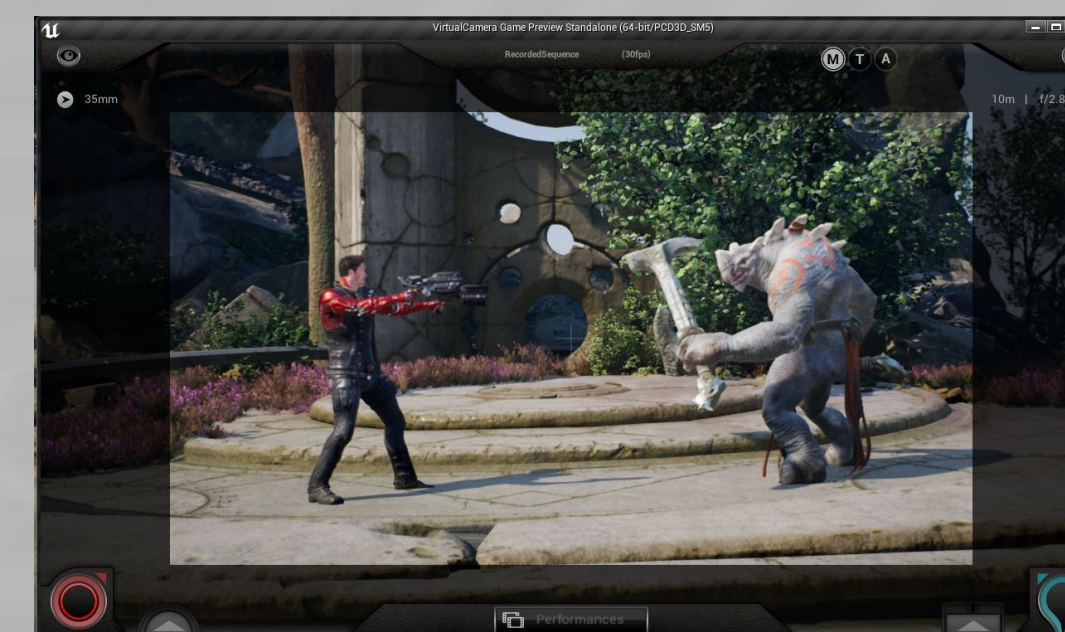
Mechanical Design



Software Design

Camera functions

- Record** - The camera's ability to record sequences and save them for later use.
- Playback** - Being able to easily re-watch footage captured by the camera at any time.
- Lens** - Our device will allow the user to switch between a variety of lenses when filming particular scenes
- Focus** - We want the film maker to feel comfortable with the focus controls on this device so that they can achieve that perfect crisp image for their work.



Customer Needs

- User friendly between industries of education and film
- Adaptable to different filming styles
- Finished product
- Adaptable and usable features that are on current systems
- Integration of Unreal Engine with controller.
- Use of an iPad as part of the controller
- Low latency between the iPad and movement within 3D space
- Adaptable to feature integration with Unreal Engine
- Designed with camera functions in mind for professional use.

Future Work

As an entrepreneurial senior design project, we will be competing in the InNOLEvation competition and in the Engineering Shark Tank.

Mechanical Prototyping

Looking forward we will continue to complete prototype iterations. As part of this process, we will be presenting these prototypes to our ideal market and take their feedback into consideration to our future modifications.

Software Functions

- Playback** - Currently playback only works on the desktop application. We are looking to complete a working playback function that can be controlled by the desktop app and the iPad platform.
- Camera placement** - We are looking to have a working camera placement function that will allow the user to easily save the placement of the camera in the scene and return once the camera has been moved. This would be able to hold several camera placements and be controlled directly from the iPad.

Function Integration

Once initial widgets are purchased, we will begin integration of software functions. At the end of prototyping, the software functions will be paired to the appropriate tactile widgets.

Acknowledgements

Team 522 would like to give thanks to our sponsors, Tom Mikota and Dr. Michael Devine, for gracing us with their experience and time. We would also like to thank our advisor and instructor, Dr. Shayne McConomy, for directing us on the right path for this project and assisting us in accomplishing our design goals.