

## Overview

The Library's Immersion Studio located in LIB386C is a full 360° space that is 6 meters in diameter and 2.3 meters tall, and serves as a resource for faculty and students to create research projects related to collaborative virtual reality (VR) experiences and immersive media. It utilizes 5 ceiling mounted projectors that stitch each image together seamlessly to create a single 360° image. No peripherals or additional headgear is required to interact with content in the Immersion Studio, which will be beneficial to projects incorporating collaborative immersive experiences. In addition, because the Immersion Studio is an open space that does not require the use of any headgear, it may be considered a more attractive alternative to experiencing 360° content for faculty and students compared to a traditional headset.

## Immersion Studio Specs

- 6 metre diameter with aluminium truss frame
- Maximum occupancy: 12 (6 during COVID-19 restrictions)
- Image aspect ratio = 8:1
- Curved, lockable door to complete 360° fabric screen
- Dartex blackout cap with integrated HVAC ducts for AC Unit

## AV system

- 5 x full HD (1920 X 1080) 3500 lumen ceiling mounted projectors
- 5 dolby surround sound speakers with 1 subwoofer
- PC media server (Outside Immersion Studio)
- Touch screen monitor (Inside Immersion Studio)
- iPad for wireless control of 360 images

## Optimum File Requirements

- 360 Photos: 8000px x 1000px
- 360 Video: 4k (3840 × 2160) 360° Video
- VR/3D Content: Packaged Unity File

## Creating Content for the Immersion Studio

In order to get started importing content or creating content for the Immersion Studio, there's a list of technologies that students and educators can utilize in order to help with their research initiatives. To get started on creating original content for the Immersion Studio, students and educators can use the following entry level equipment or open source software:

- Android/ iPhone Smartphones with Panoramic imaging capabilities
- Samsung Gear 360
- Kodak PIXPRO ORBIT360 4K 360° VR Camera
- Go Pro Max 360 Camera

The Library has access to some of this equipment, which can be found here:

<https://library.ryerson.ca/services/technology/dme-technology-equipment/>

On the software side, the Immersion Studio comes with various unique applications and API's for various 360° and 3D content. The sophisticated software of the Immersion Studio allows students and educators to import content with little effort in order to assist with their research projects. Below is a list of commonly used applications for previewing 360 content that are specifically designed to work seamlessly with the Immersion Studio.

### **Igloo Warper**

Allows 360 images and video to be displayed in the Immersion Studio. This tool can also be used to display images in the background to have other content in the foreground. An example of this would be a presentation that has multiple images in the foreground, with a 360 image in the background.

### **Igloo Playback**

Allows 360 images and videos to be activated and deactivated individually. This program is best used for presenting multiple 360 images or videos that are displayed one at a time.

### **Igloo Capture**

This program allows various forms of media to be displayed in the Immersion Studio. This includes playing 360 videos from youtube, as well as displaying 3D content through Unity.

### **Igloo VR Inspector**

Uses the 360° screen of the Immersion Studio to project VR content to an audience. This is best suited for showing a large group of students content that is being viewed on an actual VR headset from another student or educator. This application works directly with Unity.

### **Igloo Browser**

This browser is specifically designed for the Immersion Studio, and allows the entire 360 screen of the Immersion Studio to act as a web browser for displaying 360 content online.

## Software Compatibility & APIs

There are many forms of 360°, 3D and 2D content that can be exported for the Immersion Studio, which also includes using various online resources and repositories to get started. Some of the most popular formats of 360° content include Virtual Reality simulations, 360° video, LiDAR capture, and Panoramic images. Additionally, the Immersion Studio can be used to support research initiatives in areas such as digital humanities, digital media, health sciences, psychology, architecture and documentary media, while also providing opportunities for faculty and instructors to create engaging immersive experiences and course content for students.

The list below shows some of the most commonly used APIs that are compatible with the Immersion Studio.

- Yulio
- Navisworks
- Revit
- Matterport
- Unity Game Engine
- Unreal Game Engine

## What is the Immersion Studio best suited for?

The Immersion Studio is best suited for students and faculty looking to explore new forms of immersive technology. Although traditional VR applications exist that are more accessible in a larger capacity, the Immersion Studio enables collaborative immersive experiences and shared VR experiences. In addition, in terms of using traditional VR headsets, careful consideration will need to be given to the cleanliness of headsets, due to the fact that they come in contact with the person wearing them. The Immersion Studio provides a safer alternative to viewing VR content in this regard, making it a more attractive solution to projects related to VR, 360 content, or immersive media.

Below is a list of potential subject areas that could benefit from using the Immersion Studio for research initiatives, which are also accompanied by suggested use cases for each area. Please note that this list does not include all subjects that could utilize the Immersion Studio, but merely acts as a starting point for brainstorming ways in which it can be used.

- Architecture and Urban Planning (CAD models, Unity, Unreal)
- Geography (3D GIS visualization)
- History (360 panoramic images)
- Documentary Media (360 video documentaries)
- Psychology (Immersion Studio as a substitute for traditional VR)

- Hospitality and Tourism (360 video tours)
- Digital Media, New Media, Media Production (360 video and 3D environments)
- Theatre Studies (360 images for set design)

## Immersion Studio Development Tips

Although the Immersion Studio is excellent for VR applications and 360 visualization, it does come with its own set of challenges when developing for it. Most of the time, these challenges relate to the limitations of the projectors themselves rather than the software or hardware of the technology that runs the Immersion Studio. When developing for the Immersion Studio please keep the following in mind:

- Due to the nature of projection technology, colour contrast will almost always make visuals look flat, or lack some colour. Black and white photos tend to display very well however.
- Due to the fact that projectors are always projecting some form of light, blacks tend to look very flat compared to screen monitors. As a result, deep blacks should be avoided when developing visuals for the Immersion Studio. This is especially the case when developing still 360 images.
- It's important to understand the relationship between 360 content and locomotion, and how it affects a user's sense of orientation. When filming 360 video, it's best to record using a tripod to keep the camera still, and have the subject or subject matter move around the camera rather than with it. This will provide the most comfortable viewing experience.
- Drone footage is possible to view in the Immersion Studio, but careful consideration should be taken when considering the speed at which the drone is moving when capturing the footage. A fast moving drone may make some viewers experience motion sickness when viewed in the Immersion Studio.
- The native resolution of each individual projector is 1080p respectively. Due to this, visuals with extremely fine details (such as fine text) should be avoided. Although small text is legible in the Immersion Studio, fine text and detail may cause the viewer to strain their eyes to see them.
- Shadows are almost unavoidable in the Immersion Studio unless standing directly in the middle of the space. If you have a larger audience of more than 6 people in the Immersion Studio, you may want to consider using some form of seating to minimize the amount of shadows that are cast. These seats can be placed anywhere in the space, however, it would be best to consider a circular seating formation that is at least 2 feet away from the projection screen.
- There is no way of adjusting the black point on the projectors in the Immersion Studio, so this needs to be taken into consideration when designing experience that use a lot of black elements

## 360 Content Examples & Demo Materials:

### 360 Video Examples

Hospitality & Tourism - LA Tour: <https://youtu.be/JSNZbZ8gswo>

Archeology/Architecture - City of Petra: <https://youtu.be/xSiv4TkfSOE>

Indigenous Studies - 360 Pow Wow: <https://youtu.be/1fXGKypVG-o>

Nursing - Medical 360 Video: <https://youtu.be/LGkZSkfCDu4>

Documentary Media - 360 Documentary: <https://youtu.be/z9HEGHOk5hM>

History - 360 Auschwitz Experience: [https://youtu.be/EOM\\_CxAKB\\_Y](https://youtu.be/EOM_CxAKB_Y)

### Websites with 360 Content

If either the student or educator does not have immediate access to 360 or VR content, there are a number of resources available online that allows them to access and import content quickly. Below is a list of of some websites that provide high quality immersive educational content:

360 Cities: <https://www.360cities.net/>

IVPRA: <https://ivrpa.org/panoramas/>

NASA 360: <https://www.nasa.gov/multimedia/podcasting/nasa360/index.html>

ARTSTOR: <https://www.artstor.org/>

Sketchfab 3D Viewer: <https://sketchfab.com/>

### Tutorials

<https://www.igloovision.com/about/video-gallery>