

## Welcome to Week 9!

This week we will learn how to take photos and videos with a 360 camera. Photos are an important part of creating 360 tours, as they make up the world the user explores. This tutorial will focus on the Insta360 Pro camera (pictured above) but further reading will be available for the Ricoh Theta SC2 camera for interested students. To get started, read the sections below!

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### Part 1 - Intro to the Insta360 Pro Camera

#### 1.1 - How is a 360 image different from a generic panoramic image?

When most people think of an immersive image, panoramic images are usually the first to come to mind. Panoramic images are photos that are wider than they are tall with an aspect ratio of 2:1 or larger. They can be used to capture landscapes, architecture, or any other feature that cannot be fully captured with a standard aspect ratio. Panoramas that wrap a whole 360 degrees horizontally are commonly used in virtual reality, but can be limiting since some aspect ratios lack vertical height. Using a panoramic image with a limiting aspect ratio, a user could not look straight down at the ground or up at the sky.

An example of a panoramic image. Notice how the image is wide but does not capture much of the sky or ground. The aspect ratio of this image is around 4:1.

The Insta360 Pro, as well as many other 360-degree cameras used in virtual reality development, solve this problem by using equirectangular panoramic images. These images have to have an aspect ratio of 2:1 and capture the entire surrounding area, including the sky and the ground.

An example of an equirectangular panoramic image. The aspect ratio of this image is 2:1.

## 1.2 - How do 360 cameras work?

Equirectangular cameras use multiple lenses to create seamless 360 degree photos. For example, the Insta360 Pro camera uses six lenses.

Above is an image of one half of the Insta360 Camera. The other half is a reflection of this one and also has 3 lenses.

Each of the lenses takes a 200 degree image. In total, all the photos the camera will take adds up to 1200 degrees. The total number of degrees the camera takes is more than the desired 360 degrees; this is because there is some overlap between the images each lens takes. The overlap is used for stitching, which is a process that puts the images each lens takes together at the overlap in order to create a smooth image. Below is an example of an image taken by the Insta360 Pro.

An image taken by one lens of the Insta360 Pro camera.

An image taken by one lens of the Insta360 Pro camera.

The two images above are taken from two adjacent lenses. The right side of the top image and the left side of the bottom image match so the camera can put these two pictures together. Below is the completed image.

A completed photo taken by the Insta360 Pro camera.

## 1.3 - Learn to use the Insta360 Pro and Ricoh Theta SC2

Next we will learn how to use the 360 cameras available at the EAC. To get started, read the Confluence page about [how to use the Insta360 Pro camera](#).

The EAC has an additional smaller 360 camera called the Ricoh Theta SC2 available. Please read the Confluence page about [how to use the Ricoh Theta SC2 camera](#).

After a photo shoot, the images need to be saved to the EAC share drive. Please read the Confluence page about [saving 360 images to the shared drive](#).

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### **1.1 - Exercise description**

This week, we will be taking 360 images to use in your own tour! If you are an undergraduate student currently working at the EAC, Thomas Coffin will schedule a time to meet at the EAC and help you take photos. Otherwise, you will use your own camera to take photos. If neither of these options work out, we have plenty of 360 photos you can use.

The goal of taking the images is to capture the space you are in, so the exact number of photos you take is up to you. Between 3-5 is probably a good number of images to give you enough space to work in while not being overwhelming.

### **1.2 - Tips for taking photos**

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## **Part 3 - More about Confluence**

In this section, we will be covering a few more Confluence tools. Please read the [Advanced Confluence - Templates and Screenshots](#) page in the 360 DOC space to learn about these tools.