Decapod Stereo 3D Capture Guide

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Introduction

This guide documents how to use the Decapod Capture application and techniques that will help give the best results.

⚠ This documentation applies to Decapod 0.7.

Set Up Equipment

Before beginning, the equipment should be set up. To set up the equipment used for stereo 3D capture, please refer to the Decapod Stereo 3D Equipment Guide document.

Be sure to meet the minimum requirements before continuing.

Background Colours and Page Seperators

Stereo 3D capture in Decapod requires a solid coloured background, and an object to serve as a page seperator.

The background is recommended to be a bright green or bright blue, similar to the characteristics of ChromaKey blue and ChromaKey green. ChomaKey blue has an RGB value (0 0 255), and ChromaKey green has RGB value (0 255 0). When positioning the book on the background, it is recommended that some background is visible by both cameras.

Example: "Pure Blue"   (RGB Value 0 0 255)

Example: "Pure Green"   (RGB Value 0 255 0)

The page seperator is placed in the centre spine (or "gutter") of each page spread while the book is photographed. The page seperator can be a string, a drinking straw, or a pipe cleaner, and must be a solid colour different than the background colour and the colours in the book. Bright red is a good colour if the background is blue or green.

Example: "Pure Red"   (RGB Value 255 0 0)

An open book on a green background. Down the middle gutter / spine of the open book is a red string which acts as a page seperator. A solid background and a page seperator is required during stereo 3D capture.
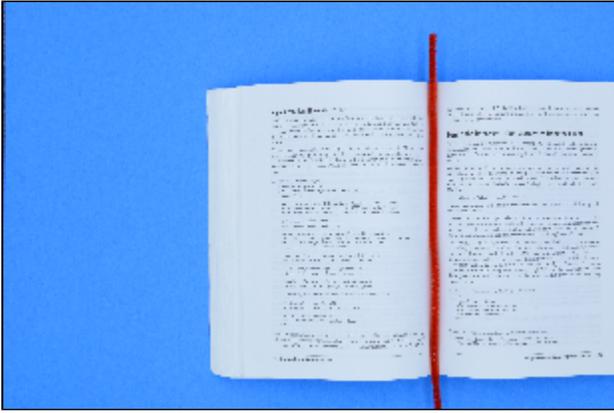
Picture above: An example open book against a bright blue background. A red pipe cleaner acts as a page separator.

Lighting

Proper lighting is critical for getting good results from stereo capture and subsequent dewarping. The environment should be very well light so that the book content is uniformly lit from edge to edge. Dark shadows should be minimized if possible, especially if it obscures text.

Glossy paper is problematic as it will create white "hot spots" on the page surface where light reflects. In this situation, care should be taken to redirect light so that the content is still evenly lit without the glare.

Position Cameras and Content

Following the Decapod Stereo 3D Equipment Guide, the cameras should be positioned perfectly perpendicular (90 degrees) to the subject. In most situations this means placing the content on a flat surface (with the solid blue or green coloured background) and have the cameras aim down at the book.

When taking pictures with the stereo cameras, the complete open book (edge to edge) should be seen in the resulting images. It is recommended that users take test photos first to ensure proper positioning of cameras and content, before committing to large quantities of work.

Connect Right Camera First (Applies to Tethered Capture Only)

Before doing any calibration or capturing, the right camera must be attached to the Decapod system first, then the left camera. Doing this out of order may cause stereo capture and subsequent dewarping to not perform properly.

To ensure that this is done properly, follow the these steps:

1. Ensure computer running Decapod is on and running.
2. Turn on the right camera.
3. Remove any memory cards if present.
4. Connect the right camera to the Decapod system with a USB cable.
5. Repeat steps 1 to 3 for the left camera.

Note:
If any camera is disconnected during capture, both cameras should be disconnected and reconnected in the manner stated above (right camera first, then left camera). If this is done in reverse order, stereo 3D dewarp may not perform properly.

Running Decapod Capture Software (Applies to Tethered Capture Only)

By default the address for Decapod Capture is: http://localhost:8081.

When the Decapod Capture interface loads, the attached cameras are checked to ensure they will function properly (you may hear the cameras take pictures at this time). If the cameras are matching and supported by the system, then you will receive a message stating that capture is ready and that stereo 3D capture is available. Users may encounter other errors, they are listed later in this document.

> ⚠ **Note:**
>
> Remove any memory cards from the cameras prior to attaching to the Decapod system. If a memory card is present in the camera and the camera is connected to Decapod, the operating system may mount the memory card and prevent Decapod from using the cameras. You will have to disconnect the USB cable, remove the memory card, and then reconnect the cable.

Downloading Images

When all capturing is complete, the stereo images can be saved by selecting the "Download Captures" button. After a short delay, there will be a prompt to download and save the archive containing all the captured images.

Untethered Stereo 3D Capturing

If using cameras untethered from the Decapod system, capturing follows the same manner as stated above (with same equipment setup, and proper positioning and lighting) with the exception that images will be stored onto memory cards on the cameras.

Care must be taken at the end of the capturing process to ensure that the images from both cameras are paired up and named properly.

The expected filename format is as follows:

```
Left camera: capture-[capture #]-0.[file extension]
Right camera: capture-[capture #]-1.[file extension]
```

Example:
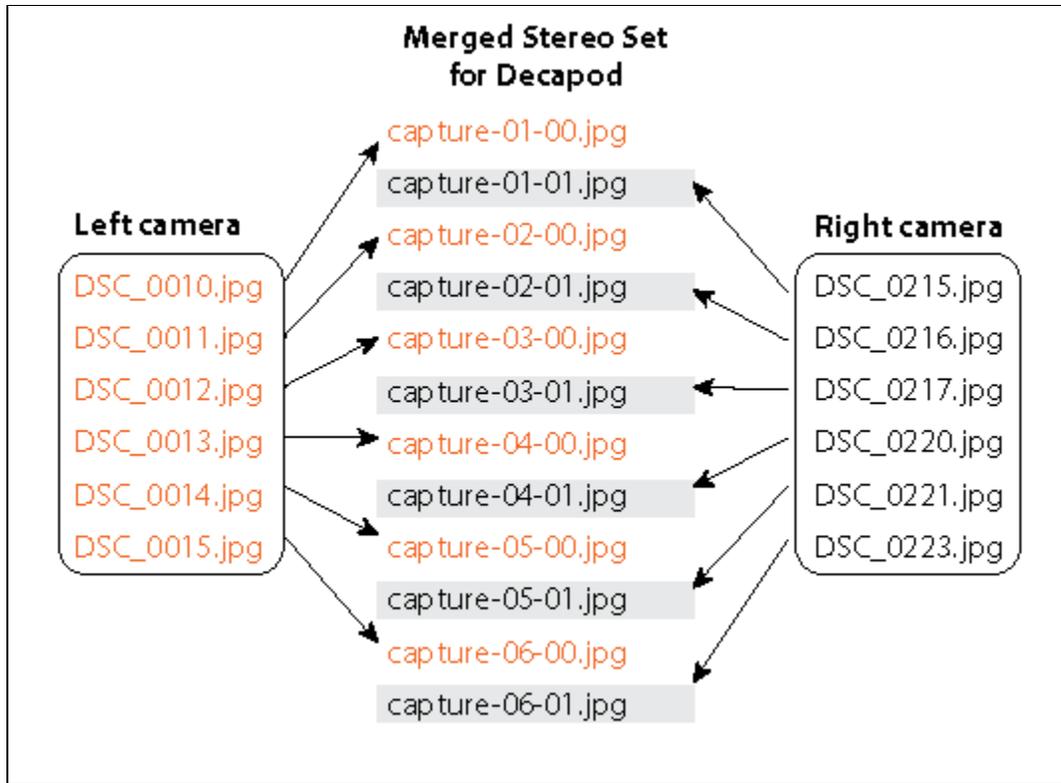
In this example, images from left and right cameras are renamed so that the images are grouped in pairs. In each pair there is a left and right image as indicated by "-0" and "-1" respectively.

> ⊘ The left image should always come before the right image in a pair (like in the above example). Reversing this order will cause calibration to give inaccurate results.

Unlike untethered capture, tethered capture can make the calibration process easier by:

- taking photos simultaneously from both cameras which can be faster than triggering the cameras manually.
- the Decapod Capture tool also creates a ZIP file of the images (with proper file names) so it can be used directly in the Stereo 3D Calibration tool without additional work.

Dewarping and Calibration

To dewarp stereo images, the camera positions used for Stereo Capture need to be recorded and its calibration information generated. To do this, it is recommended that Decapod's Stereo 3D Calibration tool be run before doing stereo capture work.

See:

- Decapod Stereo 3D Calibration Guide
- Decapod Stereo 3D Dewarp Guide

Status Messages (Applies to Tethered Capture Only)

Message: "No camera detected"

If this message is displayed, check the following:

- The cameras have power / batteries and are turned on.
- The USB cables are securely attached.
- The are no memory cards in the cameras. If there was a memory card inserted, remove the memory card, and turn off-and-on the camera.

If all of the above was attempted and the message still occurs, the camera is likely not supported by Decapod.

Message: "A camera has been disconnected."

This message is displayed when a camera that was being used for capturing becomes unavailable.

- Check to see the camera has power.
- Check that the cable is properly attached.

Try disconnecting and reconnecting all cameras. If two cameras are being used for stereo 3D captures, make sure to connect the left camera first, then the right.

Message: "There was a problem with a camera."

This message is displayed when a camera is supported, but a setting or configuration option is incorrect. The following are some possible solutions:

- Check that the camera can focus on a subject properly. Try repositioning the camera closer or further from the subject and try again.
- The camera's file format is not JPEG, TIFF or PNG - change the appropriate setting on the camera and try again.

Message: "Too many cameras detected"

- This message is displayed when there are too many cameras attached to the Decapod system. Decapod only supports 1 or 2 cameras.

Message: "Unable to create download"

This message is displayed when there is a problem creating the archive of captured images. Possible reasons for this error to occur:

- Not enough disk space to generate the archive file

Message: "Unable to capture"

This message appears when there is a problem with a camera. This problem may occur when:

- The camera is unable to focus.
- Cable has disconnected or the camera has no power.
- A memory card is present in the camera and is mounted by the operating system.
- The Capture server has malfunctioned.
- The camera may not be fully supported by the system.

To try to remedy this, ensure that the batteries are charged, the subject is within the focusing distance, and a memory card is not inserted. In the case of the Capture server malfunctioning, please contact the Decapod administrator.

Message: "Stereo Unavailable"

This is a warning message stating that the resulting captures will not be usable for Stereo 3D Dewarp since the cameras do appear to be identical.

Capturing may proceed if this message is displayed - just note that Stereo 3D Dewarp will not work on the resulting images.

Reasons for this message to occur:

- Cameras are not the same resolution, or the resulting images from each camera do not match.
- The camera models are not identical.

If you wish to have images usable in Stereo 3D Dewarp, two identical supported cameras need to be connected to Decapod.

Message: "Ready to Capture"

This message appears when the cameras are ready to begin capturing and no errors have been detected. Select the Capture button to begin.