Photographing the Book of the Dead

Capturing & stitching papyrus fragments

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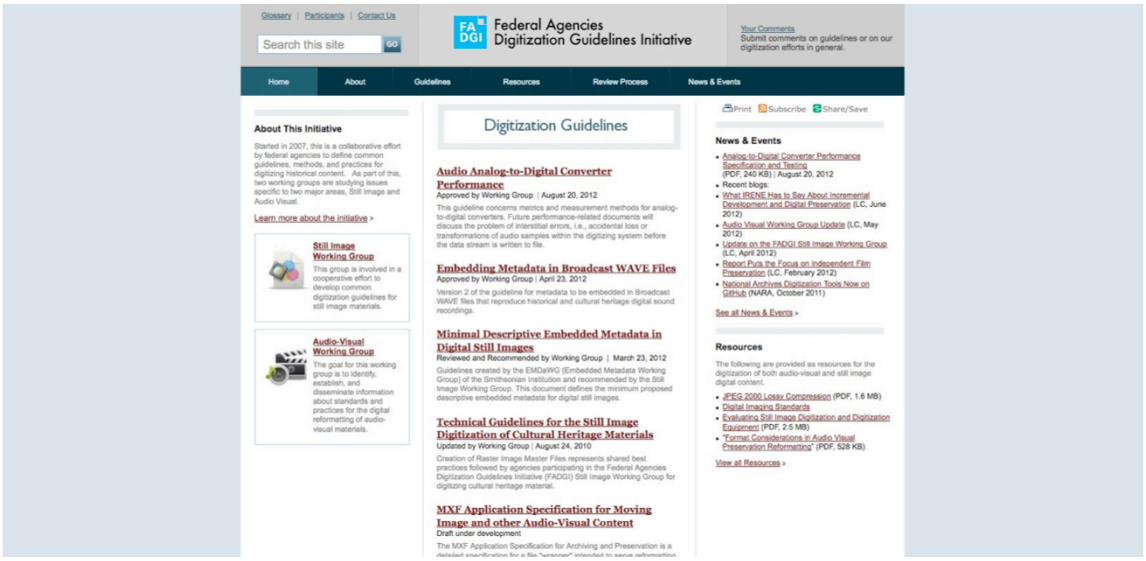
Charles H. Watts II History and Culture of the Book Program, John Carter Brown Library
Co-hosted by the Brown University Library

Digitizing Documents & Objects: Best Practices



There are multiple sets of guidelines for digitizing cultural heritage objects, and every institution makes their own standards for how they choose to image their collections. FADGI is a federal agency that many institutions, including Brown, follow.

Digitizing Documents & Objects: Best Practices

The bulk of my work is done one floor up, in our camera room. We use an 80 megapixel Leaf digital back, mounted on a specially-designed reprographic camera. The lens is made specifically for this type of work, and is incredibly sharp (since digital backs pick up every flaw and artifact).

For lighting, we have two Profoto strobes that provide even, clean lighting without exposing the materials to heat or powerful lights for long periods of time.

We also have a specially made camera stand that is calibrated to ensure that the camera and the platform are perfectly parallel to eliminate distortion and focus problems.

Finally, the camera room itself is painted in a specific neutral gray to eliminate color casts and reduce glare.

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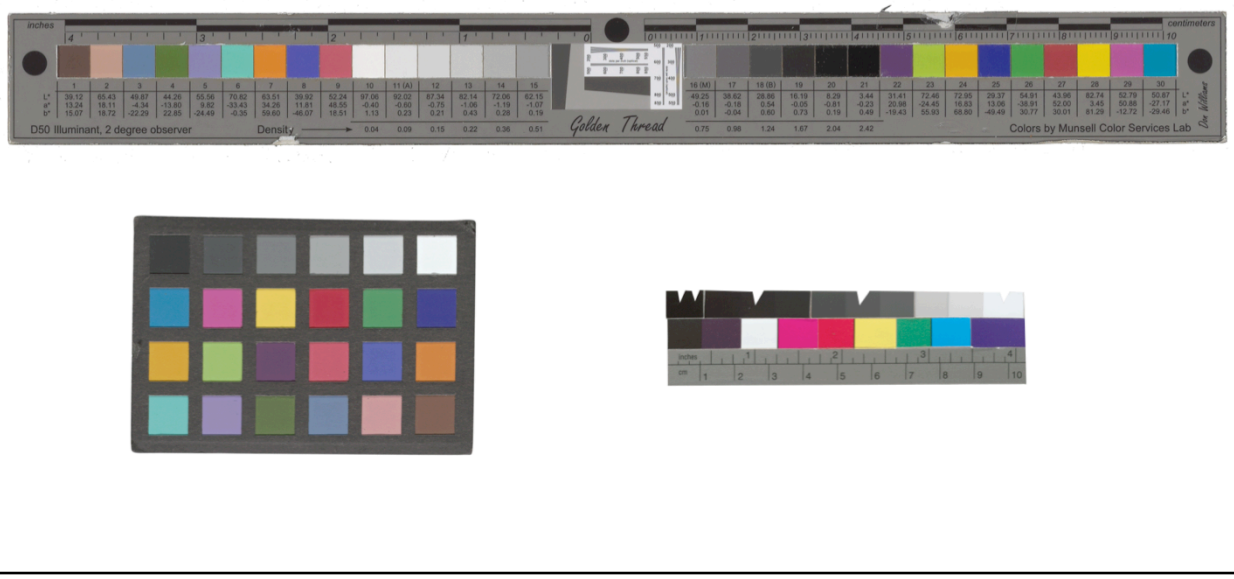


Images that we produce for digital preservation are photographed including a color target for white balance and exposure reference, and a ruler for scale reference.

This target, from Image Science Associates, is what we used in our camera room the most. We also use the X-Rite color checker card and the Kodak Q-13 target (customized by our Digital Production Specialist)

Digitizing Documents & Objects: Best Practices

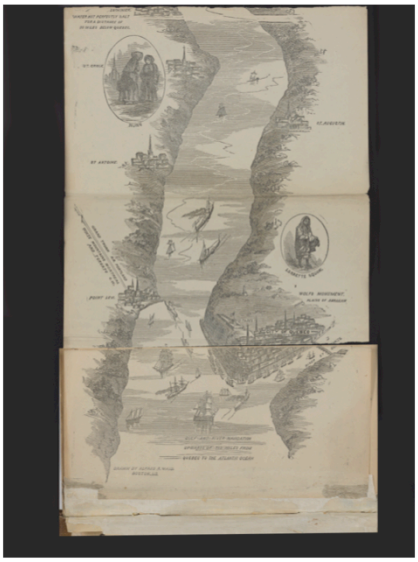
This is a typical Master scan, saved as an uncompressed TIFF. We also created derivative files, which are also uncompressed TIFFs but crop out the color information and may be converted to JEPG or JEPG 2000 files for display.

Digitizing Documents & Objects: Stitching

In many cases, objects are so large, we can't photograph them in a single image (it's physically possible, but the resolution would be so low that there's almost no point). In these cases, we photograph the objects across multiple images, and then piece them together in Photoshop, in a process called stitching.

I used this technique in the camera room with this book, *Chisholm's All Round Route and Panoramic Guide of the St. Lawrence: the Hudson River; Saratoga; Trenton Falls; Niagara … the White Mountains; Portland; Boston; New York,* published in 1874.
The book itself is five inches wide by 7.5 inches tall – the map is about 7.25 inches wide.

Digitizing Documents & Objects: Stitching



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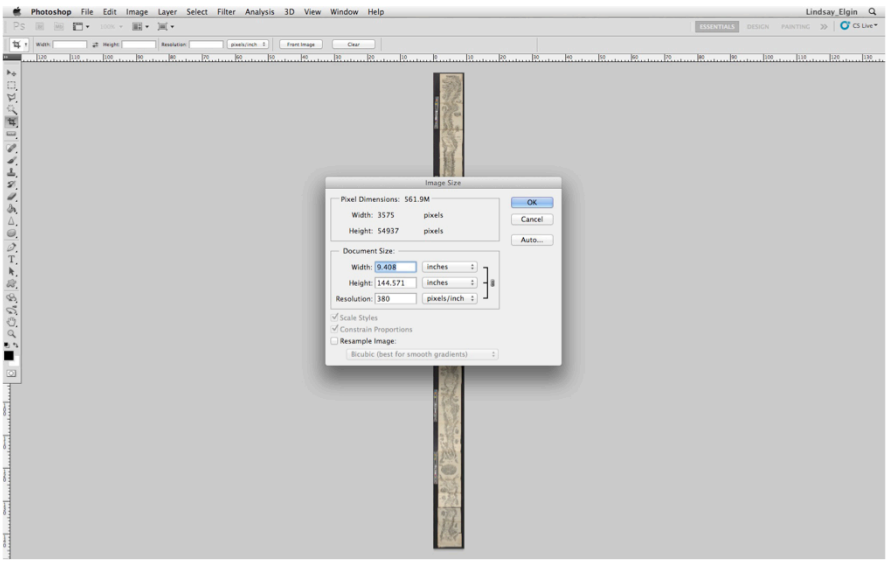
Digitizing Documents & Objects: Stitching

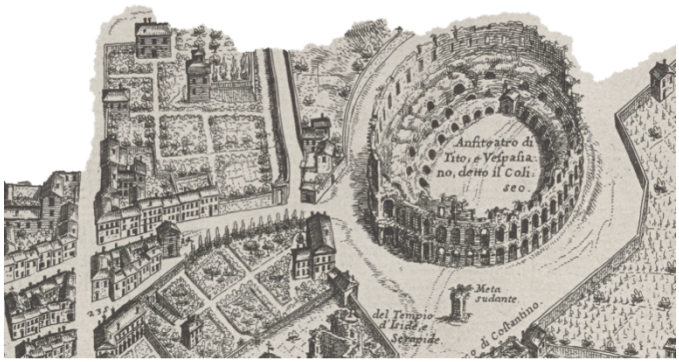
The book itself is five inches wide by 7.5 inches tall – the map is about 7.25 inches wide and almost 13 feet long. It took nine separate shots to get the entire map.

Digitizing Documents & Objects: Stitching



The book itself is five inches wide by 7.5 inches tall – the map is about 7.25 inches wide and almost 13 feet long.
Because it has these creases, it was easy to piece together.

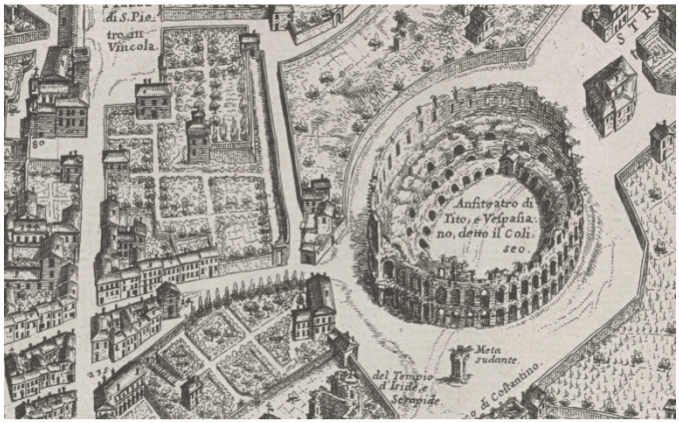
Digitizing Documents & Objects: Stitching & Photomerge



Unless it's a very straightforward image that you can do on your own, Photoshop's Photomerge is very helpful for stitching images together. It's is used a lot in the cultural heritage community for stitching maps and other documents with lots of details that are easy to render incorrectly. You simply make sure that you have a good deal of overlap for the stitches, and Photoshop has algorithms that can analyze each pixel to correctly map the images onto each other.

This is one pane of a 12-pane map that I did in Photomerge.

Digitizing Documents & Objects: Stitching & Photomerge



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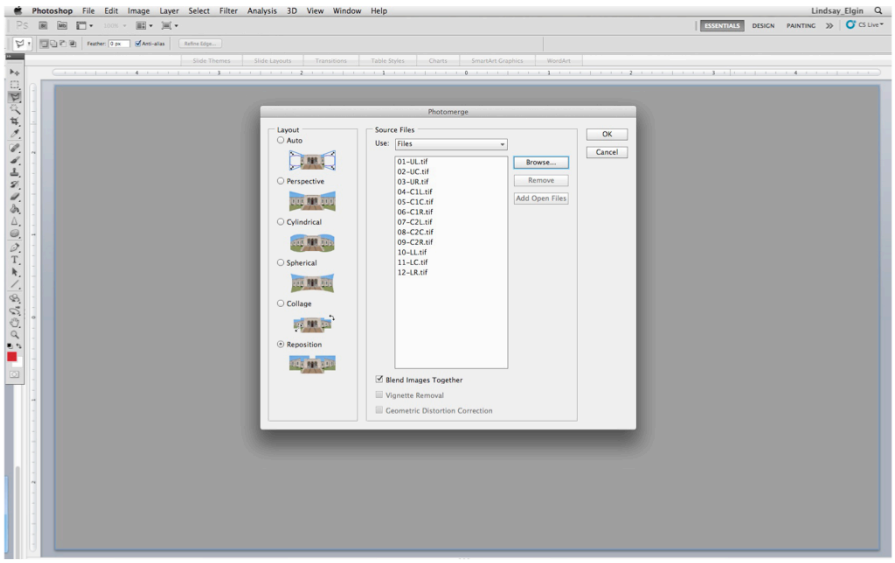

Selecting files.

Digitizing Documents & Objects: Stitching & Photomerge

Of course, merging the entire thing doesn't always work.

Digitizing Documents & Objects: Stitching & Photomerge

Sometimes it really doesn't work.

Digitizing Documents & Objects: Real-World Situations

This is a portrait from the McLellan Lincoln Collection at the Hay Library. I shot it in two exposures, one for the frame, one for the painting, making careful to avoid the sheen of the oil paint. Using masks in Photoshop, I combined the two to make use of the best exposure for each element.

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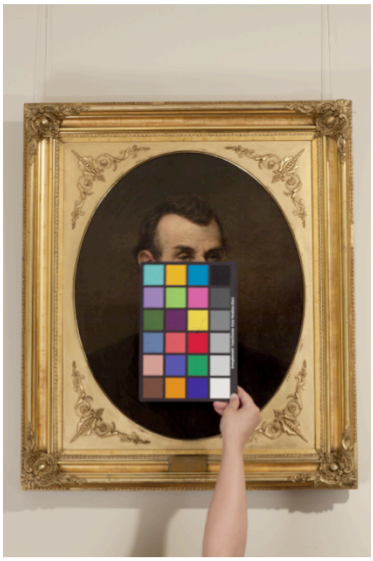
Digitizing Documents & Objects: Real-World Situations

I wanted to show this because like the Book of the Dead, this object could not be photographed in the camera room. Because I had to photograph the painting hanging on the wall. I had to light it carefully, and make sure that the angle of the camera lens was parallel to the angle of the painting.

Digitizing Documents & Objects: Real-World Situations



I also began with a color target, so I could correctly white balance the scene.

The Book of the Dead: Capture

The papyrus fragments that I was asked to photograph are, in many ways, like the Lincoln image. They had to be photographed in the conservation lab; moving them to our setup was an impossibility:
This was pre-framing, so they were just a a simple, acrylic encasement that was not very stable. Even if we could have gotten them to our camera room, we would run into two issues.

The first is the same issue with the other merges that I showed you – the objects are too big to photograph in one shot if we want any kind of usable resolution at all.

The second problem is that our platform is only 30 x 40 inches, so we would have had to build an extension to the platform to be able to even support the object for photography. Given its size and weight, this was not feasible.

This is an issue that we frequently encounter in imaging for cultural heritage materials; what the images will be used for vs. the level of logistical nightmare that we want to go into.

The Book of the Dead: Capture

So I photographed these fragments in the Conservation Lab. Michelle and Rachel had set everything up (this is NOT the setup) so that they could move the materials for me, placing each section on this flat table so I could photograph it directly from above.

This is actually a very big deal. With large objects such as this, my colleague Ben and I will work with each other to create supports, hold up the materials, etc. Any time we have any concerns, we talk to Rachel before doing anything, and always make a plan of attack for oversize and fragile materials. That being said, its very rare that we have two conservation professionals helping to handle the materials for you, so this went very quickly and allowed me to concentrate solely on the photography.

The Book of the Dead: Capture

Although we had more space, I had some issues here, since it's really not a space meant for photography.

This lighting is tricky for several reasons, most of them based on the fact that this is overhead fluorescent lighting, generally regarded to be the worst light possible for almost anything (the new daylight-balanced fluorescents are a different story).

One: It's very flat light. In our camera room we have those two lights, equidistant and at equal 45 degree angles from our platform. Fluorescent light is naturally flattening, and having them right above the object makes this problem more obvious. As a result, we don't get quite as much of the papyrus texture as we might otherwise have. Since it's encased in acrylic, that's not too big of a deal.

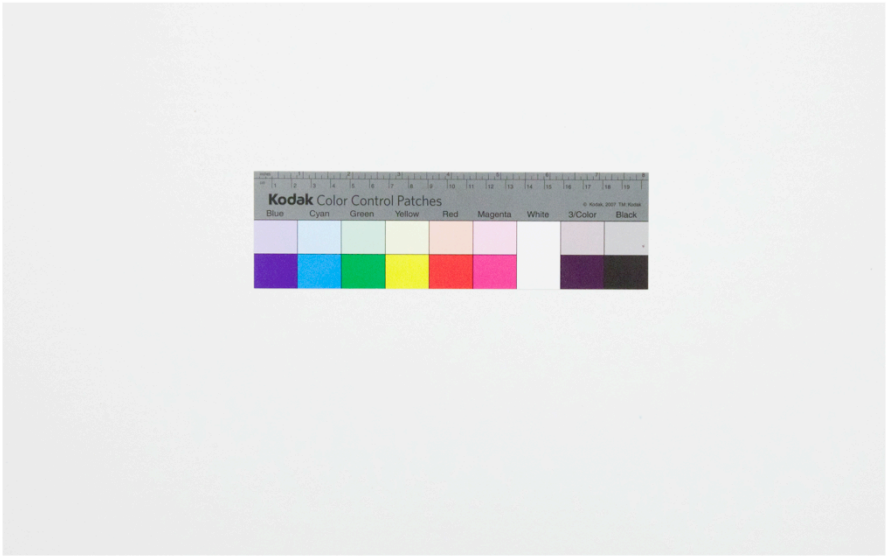
Two: It often has a green or magenta color cast. We have the color target, which I used to manually white balance to eliminate this as much as possible. I used manual settings for wb to help counteract this.

Three: It flickers. This affects both the wb and the exposure, and makes it difficult to achieve truly consistent images from one shot to the next (very important for stitching).

The Book of the Dead: Capture

I did also use a color checker card for later reference.

The Book of the Dead: Capture



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The Book of the Dead: Capture

I took multiple shots of each object.

First, I photographed each object in two to three sections (depending on their length) to ensure that I would get enough overlap to help with the stitching. I shot in the RAW mode to maximize the information I could capture.

I also took multiple photographs of each view, to ensure that I got everything in frame, that everything was in focus, and that I had overall viable images to work with.

The Book of the Dead: Capture

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My next step was to open each image in Abode Photoshop Lightroom. This program allows for file organization, and excellent non-destructive image editing. While not as large a program as Photoshop, Lightroom allows you to easily edit photographs for tone, color, white balance, exposure, etc.

I used Lightroom to review the images and determine which shot of each section I wanted to use. I then corrected the exposure, wb, alignment and crop of the images. I output full resolution TIFF images that I could then merge in Photoshop.

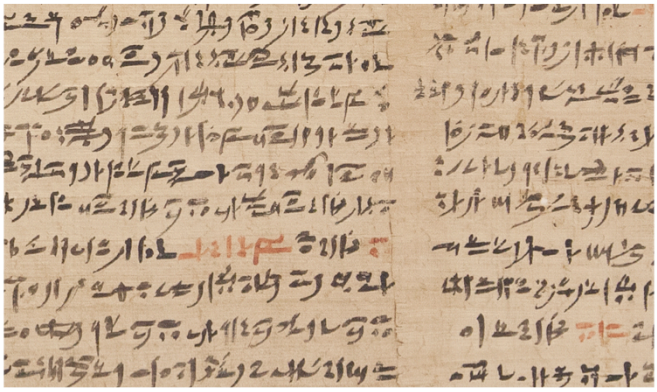
The Book of the Dead: Stitching

I used photomerge to stitch them together. This is the mask that Photoshop used on one section, to blend it in with the other section.

The Book of the Dead: Stitching

The merge looks great, here.

The Book of the Dead: Stitching



The Book of the Dead: Stitching

The final step was to take the merged image, and even out the exposure as tones.

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The Book of the Dead: Stitching

This image involved multiple steps, as I had the same stitching and exposure concerns, but also had to adjust for lens problems (the zoom lens didn't stay in place – lens creep).

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