

RESOLVING RESOLUTION

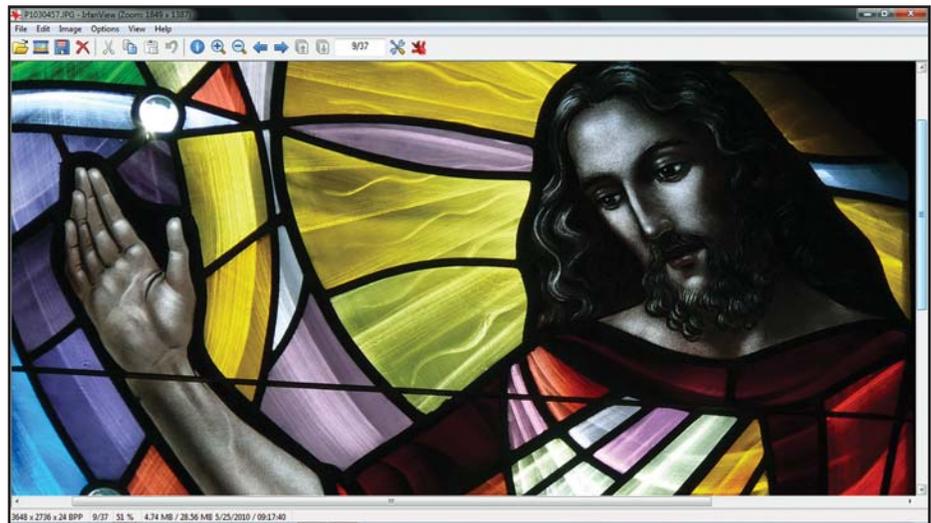
Part Two(ish)

by Richard Gross

Let's recap, just for a moment. Remember in Part One of this series, I wrote: "Today, photographers who want to take pictures for publication have to know about things like resolution. They have to understand that just because a picture looks good on the screen does not mean it will look good in print or even that it can be printed. They also have to understand that there are vast differences between printing on an inkjet printer and printing on a printing press." This is a concept that will become very important now as we begin to look at determining what the resolution of a given digital photograph is and how that information can be put to use.

Recall also that in Part One-and-a-Half, I wrote that "Best practice is to take digital photographs on the highest resolution setting that a given camera offers and then to store those original images (perhaps on a CD or DVD) and work with copies of the originals." This is also very important. You should always work with copies of the original picture, which was taken at the highest resolution that your particular camera can image, and leave the originals unaltered. This accomplishes two things: primarily, it means that you can always go back to the original if something goes wrong in the editing process, but it also means that the original image will be stored securely on a writable media other than your hard drive, should the hard drive fail. (They are prone to that.)

Previously, we've looked at a few different output devices (screen, inkjet, printing press) and how resolution is important (and different) for each. We've also looked a little bit at what resolution is in terms of the pixel and the grids of pixels from which a given image is composed. This time, we're going to look



The images used to illustrate this article are actual screenshots from the editor's laptop computer as he selected images from Pickel Studio's Holy Family Mausoleum installation, which is also featured in this issue. The images were copied from the folder in which the originals are kept onto a 4GB flash drive, which became the working folder for this project. Originally, there were more than 400 images. These were culled in Irfanview to a much more manageable 37 images, from which the final images for publication were selected.

more closely at determining what the resolution of a given image is and why that information is useful. To get a better handle on how resolution might have application in the real world, let's consider the unfortunate case of J. Alfred Prufrock.

Alfred first became interested in art through being introduced by some lady-friends to the works of Michelangelo, and he became fascinated by glass after observing one night a markedly yellow fog outside his window. He pursued a career in stained glass and became quite good at it, with a number of prestigious commissions spread across the country. Now, as he looks back on his career, Alfred decides that he would like to write a retrospective of the last 10 years of his work for publication in *The Stained Glass Quarterly*.

Ten years ago, at the dawn on the new millennium, Alfred saw that digital photography was the wave of the future,

and he bought a digital camera. It was a three-megabyte digital camera, and he took a number of pictures of his work with it. Over the last decade, he's had two more digital cameras – one of them five megapixels, and the other, the latest, is 12 megapixels. Unfortunately, Alfred sometimes forgets to take his camera with him, and so a number of the digital images from which he has to draw were taken with his iPhone, at about one megapixel. Additionally, Alfred has not always made a practice of using a tripod and setting his camera on the finest (highest-resolution) setting available. Also, he has never renamed any of his digital image files so every one of them has the default serial number name given it by the camera, and they are all stored in his "My Pictures" folder. Finally, a number of his best images were sampled down to 1024x768 pixel resolution so he could post them on the Internet and email them; he never

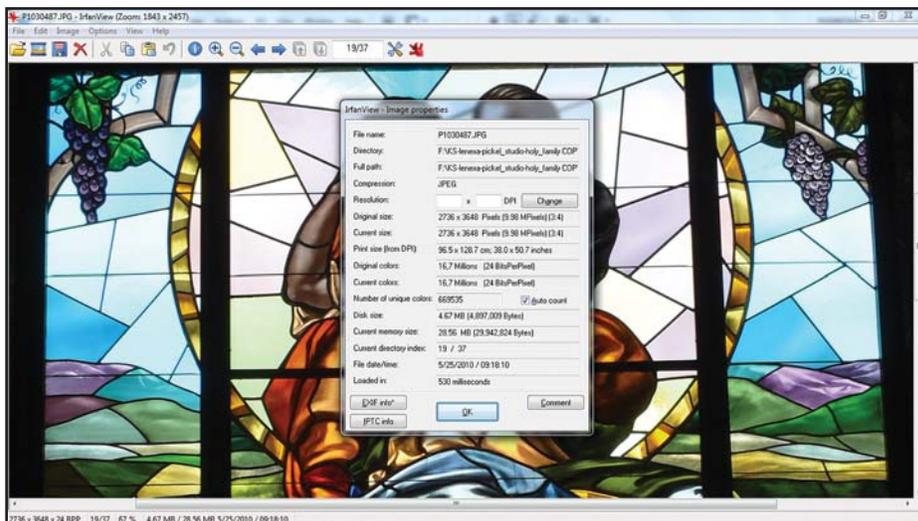
made a copy and so has down-sampled his originals with no way to return to the original higher-resolution images.

Alfred's case is unfortunate indeed. Now that he wants to have some of his work published, he has to try to unscramble the egg and find out if he's got anything with which he can work. His other option is to revisit his key installations and re-photograph them using his new 12-megapixel camera and a tripod. (This would actually be the better option for him, but, in Alfred's case, this would mean visits to a number of states and would be expensive both in terms of time taken and money spent.)

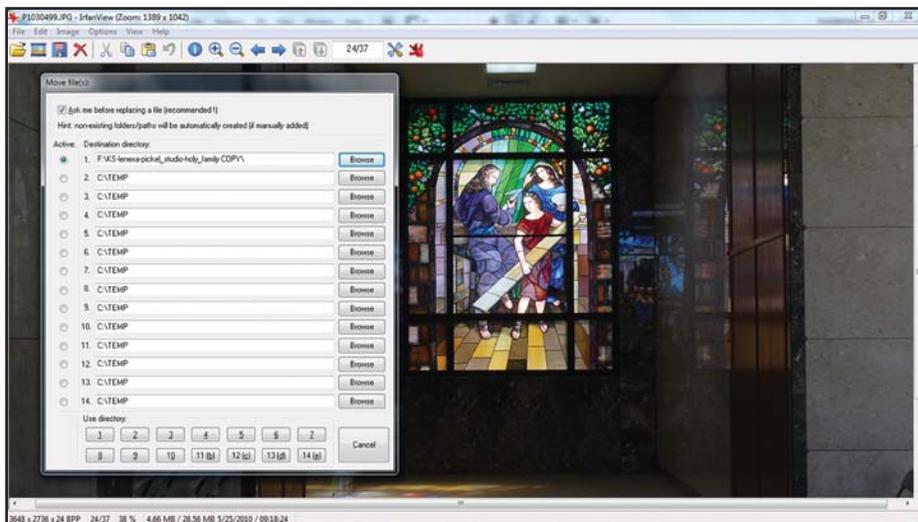
There are several image viewers that will be very useful to Alfred as he sorts and selects his photographs. Windows has an image viewer built into Windows Explorer, but there are software packages available that work better, faster, and smarter than the built-in Windows viewer. For this task, Alfred would also do very well to download an incredibly useful piece of software called Irfanview (\$10 for a commercial license; free for non-commercial use; www.irfanview.com; be sure to download both the software and the plug-ins.)

Once downloaded, Alfred can begin examining his collection of photographs with Irfanview; it has some editing capabilities, but, for image editing, there are better packages available. Viewing and sorting is where Irfanview shines. On installation, it will ask if it should be made the default image viewer on your system. For me, the answer here is always "yes," and it has been since the late 1990s. When I get a new computer, this is what I install first. I like this software a lot.

Once Alfred has installed the software and its plug-ins, he's ready to begin viewing his collection of photographs and discovering what is useful and what is not. He would navigate to his "My Pictures" folder and double-click on one of his photographs. This would, of course,



In Irfanview, simply pressing the "i" key brings up the Image properties dialogue, in which we can see this image is almost 10 megapixels in size and can be printed at up to approximately 9"x12", which is determined by dividing the 2736-pixel-by-3648-pixel measurement that Irfanview reports by the 300 pixels-per-inch required to print at press resolution.

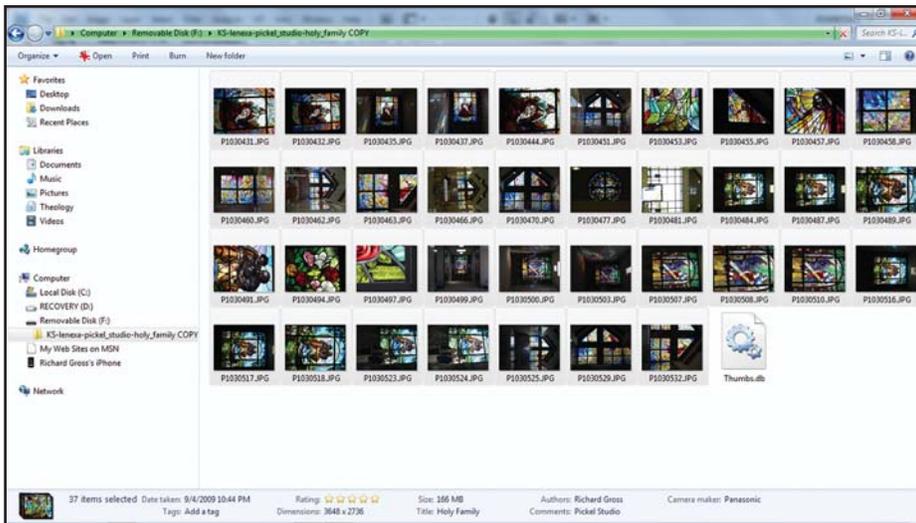


Irfanview's Move dialogue (F7) and Copy dialogue (F8) are very handy for organizing images.

launch Irfanview and display the photograph he double-clicked.

Then, looking at the image, Alfred could decide if it was useful or not useful. If not, then he simply presses the right arrow key and moves to the next image. However, if Alfred likes the image and decides that he might want to use it in his article, he then has to determine if that is possible. To do this, he simply presses the "i" key, and Irfanview brings up the "Image Properties" dialogue box.

On the "Current Size" line, Alfred will see everything he needs to tell whether this photograph is high-enough resolution to use in print. The first and most important bit of information is the size of the image's pixel grid; this will be expressed as #####x##### Pixels, which shows the number of pixels wide by the number of pixels high. Hopefully, for Alfred's sake, each of these numbers will be four digits long, because Alfred knows he has to divide each number by 300 to



Once the initial selections are made, Windows Explorer reports that the 37 images selected are 166 megabytes total in size. Since each individual picture takes approximately 4.7 megabytes of disk space, only two images could be emailed at a time and still remain under the 10-megabyte limit. In this case, it would probably be wise to write and mail a CD-ROM. However, if proper arrangements were made, these images could be emailed. This might be the preferred approach for images being mailed, for example, from overseas in places where international mail is less than reliable.

find out the image's maximum safe print-resolution size.

The next bit of information Irfanview provides is the image's size in megapixels. This will be expressed as (#/# MPixels); if it's not more than one, then this is not displayed. This is, basically, the image's width multiplied by the height and divided by a million. Roughly. Finally, you'll see the image size ratio (for example, 4:3) of the given picture.

With this information, Alfred knows what he needs to know to make an informed decision about the usefulness of the image. He knows whether or not he likes it in the first place, and he knows if it is even reasonably close to print resolution (if it's not at least one megapixel, it's really not even worth considering). If both of these conditions are true, then all he has to do is close the Image Properties dialogue and press the "F8" key. This will bring up the "Copy file(s)" dialogue box, where Alfred can specify a new directory into which to copy the image so he has easy access to it and to all of the images he selects for his project later. "F7" brings up the "Move file(s)" dialogue box,

which looks and works very much like the "Copy file(s)" dialogue, except it does not leave the original file in place. Alfred, though, has learned from his past sins and vowed never to manipulate originals again when it is so fast, effective, and foolproof to make a copy of the image and work with that.

Using Irfanview, what might take hours using Windows Explorer and Photoshop can be accomplished in a matter of minutes. Once the images are sorted, Alfred will know what he has to work with and what he needs to re-photograph. He's ready to begin the 10-year retrospective of his work.

Once it's written and ready to send, Alfred has to decide how best to get the image files and the word-processor files to the magazine for consideration. Suppose he has created a working folder in his "My Documents" directory called "/My Documents/Ten-Year Retrospective." He could go to his "My Documents" folder, right-click on the "Ten-Year Retrospective" directory, and select "Properties" to find out how big the entire folder is. Say, for the sake of example, that

it's roughly 43 megabytes in size and consists of two word-processor documents and 14 pictures.

There are two things that Alfred can do here. He can write the entire subfolder to a CD-ROM and put it in the mail, or he can email the files. Either one will work as long as Alfred takes the proper steps and precautions to make sure there are no surprises.

Writing the files to a CD-ROM (never a rewritable CD) and packaging it in a plastic CD case inside of a bubble mailer will get the files safely to the magazine about a week later, provided the Post Office doesn't lose it, the automated equipment doesn't eat it, and it doesn't end up in a garage in Philadelphia. Emailing the files will get them there in a matter of minutes... provided Alfred doesn't mess it up. (One thing Alfred has discovered in life is this: the more they improve technology, the more he is personally responsible for the outcome, and the less he is able to blame the guy at the photo lab or the mail carrier.)

If emailing the material was as simple as selecting the file, right-clicking, selecting "Send as Email," and typing an address, Alfred would have very few problems. However, there is something that can go wrong at every stage of that list if Alfred makes wrong assumptions or doesn't know that large emails (more than five- or ten-megabytes, depending on the recipient's email provider) sometimes simply get lost in transmission.

As was said earlier, Alfred has approximately 43 megabytes of information to send. That's an awful lot of data to send as a single email, and there is a high likelihood that it would not make it to its recipient, and, even if it did, it could easily fill up an email box, causing other emails to bounce... which would not likely endear Alfred to the recipient.

In this case, there are simply too many variables and unknowns for Alfred to be able to make an intelligent decision. He needs more information, and the best

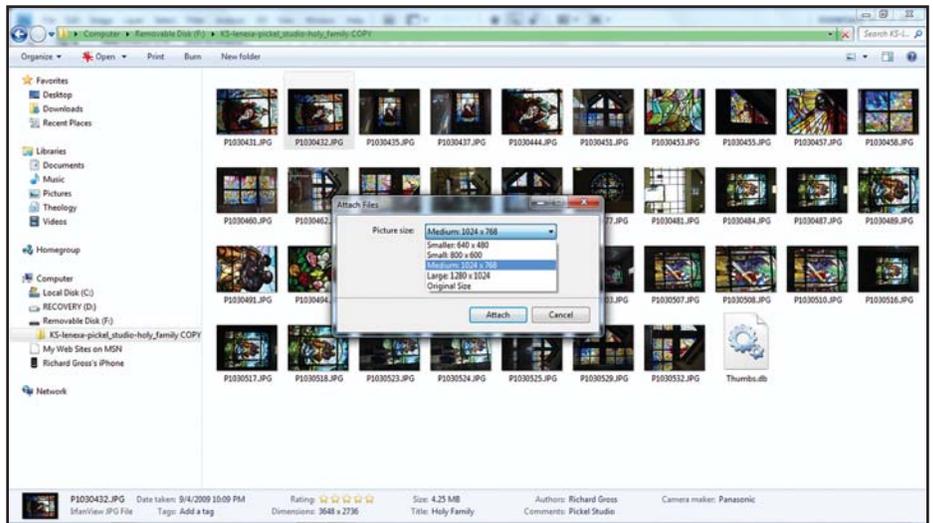
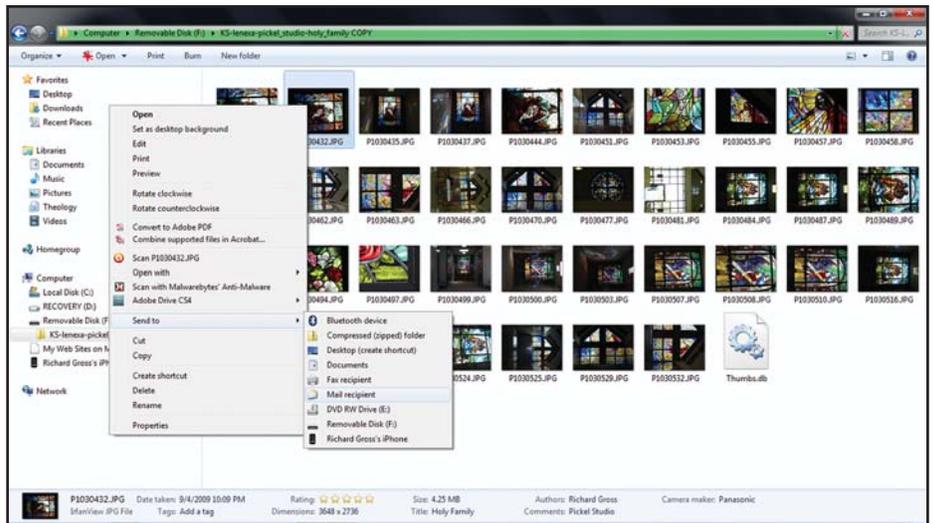
place to get it is from the person to whom he wants to send the email. Alfred would be well advised at this point to send a plain email stating what he has to send and asking if that is possible with the recipient's email and, if so, when it would be convenient for the recipient to receive it. This way, Alfred knows whether or not the recipient can even receive such a large email and the recipient knows approximately when to expect it, so he can download it from his email server before his account fills up to its quota and mail starts bouncing.

As we know, the whole point of what Alfred has been through here is to write a 10-year retrospective for *The Stained Glass Quarterly*. So, if Alfred sent such an inquiry email to me, the response he would receive would advise him that he should address his email to webmaster@sgaaonline.com, which is the account here designed to receive large files; that each individual email should be under 10 megabytes total but that he is welcome to send multiple emails simultaneously; and finally that he is welcome to send them at his convenience any time during normal business hours.

The last major hurdle that Alfred has to cross is one created by his email software. Some email software, when adding a picture attachment, will ask if the picture should be made smaller for email transmission. This might be a helpful feature when sending snapshots to family, but it is never helpful when sending images for publication. Alfred, of course, wants to make sure that all pictures are sent at "Original" size.

Finally, after all of the emails have been transmitted – in Alfred's case it would require at least five large emails – Alfred should follow up with a final email with no attachments that states what was sent, how many emails it took, and inquiring whether or not they were received.

Not all that long ago, submitting an article for consideration for publication would have been done by mailing in a



Be aware that if you right-click on an image and select to send it via email, Windows will ask if you want to downsample the image; its default setting is "medium," which is entirely too small to be of any use in publishing. Always select to send the image at original size.

typed, double-spaced manuscript accompanied by a page or two of 35mm slides. It's still possible to do it that way, but fewer and fewer people are. In the 2009 calendar year, there were only two articles that ran in *The Stained Glass Quarterly* in which the images were scanned from slides. All of the rest were taken with a digital camera and sent electronically.

Film is becoming rarer and rarer. By choice or by necessity, photographers are going to use digital cameras. However, those who want to photograph their own stained glass work should not be lulled into believing that they need only point the camera at the installation, press the button, and the computer will do every-

thing else. This isn't the case; it never is with computers. The operator still has to know what he's doing and why he's doing it – he has to know about things like resolution if he is going to achieve a satisfactory result. There are plenty of tools and techniques that make the task less daunting, but, at the end of the day, it is still the individual's responsibility to know what he is doing.