Advantages of Adobe Photoshop Elements 2.0* over the full version of Photoshop*

Jerry Sedgewick
University of Minnesota
sedge001@umn.edu

The high cost of Photoshop and its increasing complexity with each new version can leave the user longing for a version that is a fraction of the price, but still contains the basic features. That longing may be met with Adobe's Photoshop Elements.

Certainly its price is attractive at $99.00 on some websites and about $50.00 on others (including sites for those in Education). For the shopper who wishes to do a little extra research, a web search may reveal that Elements is included with a scanner or ink jet printer at well under $99.00, making the purchase a 2-for-1.

Elements is a pared down version of Photoshop, but it is still a viable solution for almost all image processing needs. Simply because it is pared down, it becomes very attractive for occasional users who do not desire to re-learn the full version of Photoshop, let alone yet another upgrade and yet more frustrating minutea to discover. Only those who need to preserve 16-bit images for subsequent intensity/density measurements, and those who need to create CMYK files for publication, will need the full version of Photoshop (though the site hiddenelements.com advertises the ability to use Elements for CMYK conversion).

Because Elements is pared down and relatively uncluttered isn't the only attraction: even though some features are missing, plug-ins and actions can be downloaded to add functionality, or to achieve the same end using only the tools that are available. These added features for functionality are advertised at hiddenelements.com, and a full set of actions with links to plug-ins can be found at quickphotoshop.com.

Within Elements itself, sans plugins, you'll find the basic contrast and color correction tools (*Levels* and *Hue & Saturation*, respectively), the full set of filters (including *Unsharp Mask* for sharpening), means for modifying selections (with the exception of *Transform Selection* and *Color Range*, unless plug-ins are downloaded), rotation, scaling, resizing, and transforming tools; and nearly every commonly used tool in the toolbar (with the laudable exclusion of the Bandaid tool, a tool that so effective at retouching an image that the unethical placement of new features in an image is near impossible to detect). These tools, by themselves, can accomplish nearly every task done in the full version of Photoshop.

Amazingly, some features have been included in Elements that do not exist in Photoshop 7.0 and lower. Video frames can be acquired from movies, as long as these movies are saved in the .avi (Windows), .mov (Macintosh) and .mpg formats. Under *File*, select *Import* and then *Frame from Video*. Use the Browse button to find the file, and then click the *Grab Frame* button as desired.

An image stitching feature is included as well. In Elements it is called *Create Photomerge* under *File*. The limitation to this feature lies in its inability to stitch together more than a single row of images. The advantage, however, lies in its abilities to blend together two images so that the overlap appears seamless.

Automatic functions for straightening and cropping a tilted image are included under *Image* > *Rotate*. Depending on whether the image has clearly defined horizonal or vertical lines or features, this auto-correction saves time.

Three additions have been included for correcting images. Two relate to corrections commonly needed when taking photos on vacations. One is called Fill Flash, a function that brightens dark features lost in shadows. The name relates to a technique used by professional photographers to lighten up shadows. Typically, shadows are "filled" with light through the use of a flash, what is done when deep shadows are cast by strong sunlight. This feature works much like using the Curves tool to lighten only shadow values without affecting pixel values in the midtone to white range. The Fill Flash dialogue box also includes a saturation slider. This slider is included to increase color intensity after lightening, either because lightening reduced the intensity of color in the shadows, or because color intensity wasn't there in the first place. This tool can be tried on images in which shadows are too deep and without color saturation, such as those collected from a stereo microscope.

The other tool is called Adjust Backlighting, made for darkening bright features behind subjects of interest, such as distant mountains on a bright day. This feature works only on the lighter parts of the image. The Adjust Backlighting can be useful for flattening out uneven expanses of the same tonal range. Typically, the correction involves two steps. First, Adjust Backlighting is used to darken the entire background until all features appear to have the same pixel value. Then, *Levels* can be used to move the white triangle to the left toward the histogram to brighten the overall image. This tool can be helpful for correcting unevenness in gels, blots, DIC/Nomarski images, phase contrast images, and TEM micrographs. Its efficacy depends entirely on the nature of the image, something that can very well be "hit or miss."

The third addition can be most helpful. That tool is called Color Cast, and it can be used with both grayscale and color images. Every imaging device, whether a camera or scanner, tends to add an overall color shift to the image. Thus, it follows that all color images should be color corrected using post-processing software, in opposition to the idea that the original image taken by a camera is the "truest" image. It's not. Most imaging devices need color correction in post processing software to return color to its correct hues.

Color Cast works by clicking on a part of the image that is either a slightly off-white color, a black (not recommended) or a light gray. The efficacy of this correction depends entirely upon where the eyedropper tool is placed when clicking. If the wrong location on the image is clicked on, and the color correction is dramatic, then click cancel in the dialogue box and start again, only this time click at another location on the image. The correction should be subtle and leave the user with the feeling that the colors are much better even though it wasn't so evident at the start.

Note that this tool may not accurately auto-determine whether the part of the image clicked on is, indeed, white, or a light gray. If *Color Cast* repeatedly shifts colors dramatically when clicking on vairous

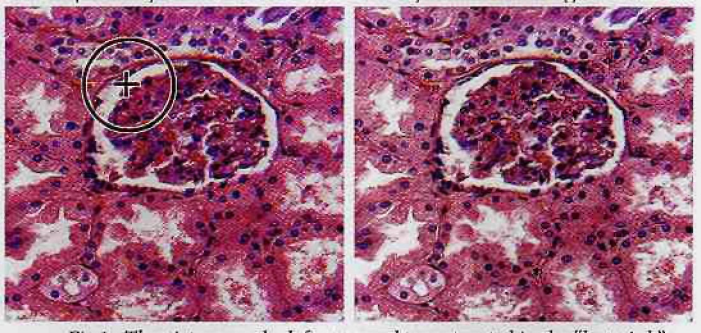


Fig 1. The picture on the left appeared too saturated in the "hot pink" for an H&E stained sample. To correct for it, Color Cast was chosen and the eyedropper tool from the Color Cast dialogue box was clicked at the crosshair location shown in the picture. This produced undesireable results. Using Levels, the white eyedropper tool at the bottom right of the Levels dialogue box was clicked on the same location. This time, the result looked acceptable, but the pink was still too intense. To further de-saturate the pink, Hue and Saturation was chosen, and the Saturation slider was moved to the left about 10 units. The picture on the right shows the correction.

https://doi.org/10.1017/S1551929500054778 Published online by Cambridge University Press

http://dx.doi.org/10.1017/S1551929500054778 Published online by Cambridge University Press

SHAPING THE FUTURE TOGETHER.

DESIGNED WITH YOU, AND FOR YOU.

Your world is demanding. You need fast, accurate results. And your time is limited. At FEI, we listen to you. We deliver the solutions you need to keep pace with your demanding world. We design, develop and manufacture our own hardware, we make our own software, and we specialize in integrating the two to give seamless, high performance solutions. You get the smart data that you expect with confidence of its accuracy. Tecnai™ G² is a truly universal imaging and analysis solution that seamlessly embeds all peripherals and software into one powerful instrument. It puts you in total digital control of your advanced TEM environment.

WELCOME TO FEI. WHERE SKILL, EXPERIENCE, AND INNOVATION ARE UNITED.

FEI Software

FEI COMPANY™
TOOLS FOR NANOTECH

WWW.FEICOMPANY.COM

IlluminatIR™

THEY SAY THE ONLY ARE CERTAIN ARE WITH THE ILLUMINATIR

The IlluminatIR is a miniature FT-IR spectrometer that mounts between the eye piece and the body of an infinity corrected light microscope that requires no additional bench space.

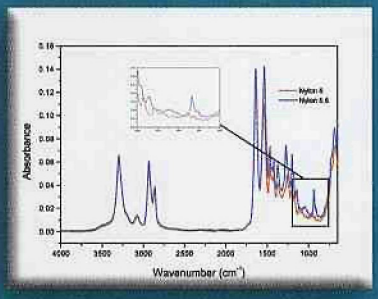
©2003 SensIR Making FT-IR Useful and IlluminatIR are trademarks of SensIR Technologies. The IlluminatIR is covered by one or more of the following patents: USP 5,552,604, USP 5,703,366, USP 5,172,192

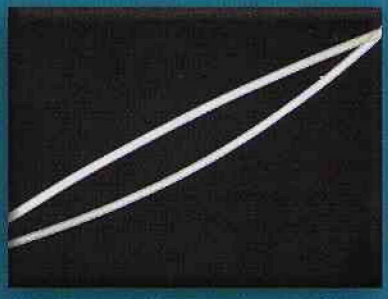
https://doi.org/10.1017/S1551929500054778 Published online by Cambridge University Press

THINGS IN LIFE THAT DEATH AND TAXES. THERE IS ONE MORE.

IlluminatIR adds the power of FT-IR analysis to *your* light microscope

Introducing the IlluminatIR, the only miniaturized FT-IR system that attaches directly to your favorite light microscope. Add the power of molecular analysis to your visual interpretation for the most accurate and objective results.





When samples are visually identical, FT-IR microscopy can show you the difference.
Visually these two nylon fibers are identical. However, when FT-IR analysis is run on each of the fibers and their spectra is overlaid the difference in the two fibers becomes clear. The top fiber was identified as Nylon 6 and the bottom fiber to be Nylon 6,6.

Only IlluminatIR:

- provides high quality infrared data and superior visual quality
- easily attaches to infinity corrected microscopes
- maintains all the capabilities of your microscope, i.e. polarization, fluorescence, Nomarski or image analysis, etc.
- can run FT-IR analysis simply with the turn of an objective – no need to move the sample
- adds these capabilities without taking up additional bench space
- very easy to use and maintain

The IlluminatIR: it will change the way microscopes are used forever.

MAKE YOUR OWN OBJECTIVE OPINION.

SensIR TECHNOLOGIES
Making FT-IR Useful™

https://doi.org/10.1017/S1551929500054778 Published online by Cambridge University Press

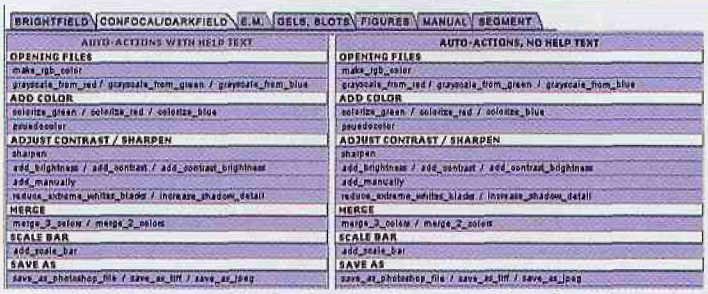


Fig 2. An example of automated features for Photoshop Elements using the Photoshop for Science actions available at quickphotoshop.com. Confocal and darkfield actions are shown.

parts of the image that is white or gray, then opt for using the eyedropper tools in the *Levels* dialogue box. Under *Enhance*, choose *Adjust Brightness/Contrast* then *Levels* (or control/command + L). Choose the white or gray eyedropper tool in the lower left of the Levels dialogue box. Click on white or gray locations within your image, depending on the eyedropper tool you have chosen. This time the correction should work (see figure 1).

Elements also includes a batch conversion feature for converting files into various formats, specified dimensions, and into numeric order. This feature can be found under *File, Batch Processing*. It will convert every image file in a chosen directory. This is a good way to duplicate files in order to save the original for archiving purposes and to preserve magnification for drawing scale bars. Lower resolution JPEG files can be duplicated from original files for insertion into Microsoft products, such as PowerPoint and Word (be sure to pick the Maximum level for the amount of compression to preserve as much data as possible). Higher resolution TIFF files can be converted to PSD (photoshop) files for color/contrast correction, sizing to publications at specific output resolutions (the "dots per inch" settings) and for the production of figures. Finally, these can be made into TIFF files for publication purposes.

If you wish to make your images a part of a slideshow, an automated feature is included to convert images into the Acrobat format. Under *File*, choose *Automation Tools* and then *PDF Slideshow*. If all images to be included in the slide show exist in a directory, choose it in order to include all the image files in the slideshow. You can choose the transition effect with this feature, as well as autoplay.

If you choose to download and install step-by-step actions from the quickphotoshop.com website, you will see a welcome screen when Elements loads up (if this screen has been inactivated, it can be re-activated by clicking on *Welcome* under *Window*). The complete collection includes a screen that is divided into several tabs, each thematically related to functional areas in research. These are meant to be followed in step-by-step fashion, either with or without explanatory text, to make the image correction and enhancement process straightforward. These plug-ins are inexpensive, each harnesses the power of the complete version of Photoshop, and the step-by-step method makes the task of image correction painless (see figure 2).

In all, the features of Elements may very well make it the program of choice, even when labs have already purchased Photoshop. Elements provides enough features to make it comparable to the full version of Photoshop, it can be used by inexperienced or occasional users with added plug-ins, and it comes without the frills and frustrations of endless new versions. ■

Photoshop and Photoshop Elements are registered trademarks of the Adobe Corporation. PowerPoint and Word are registered trademarks of the Microsoft Corporation.

Shed Light On Your X-Ray Analysis With

Electron Flight Simulator

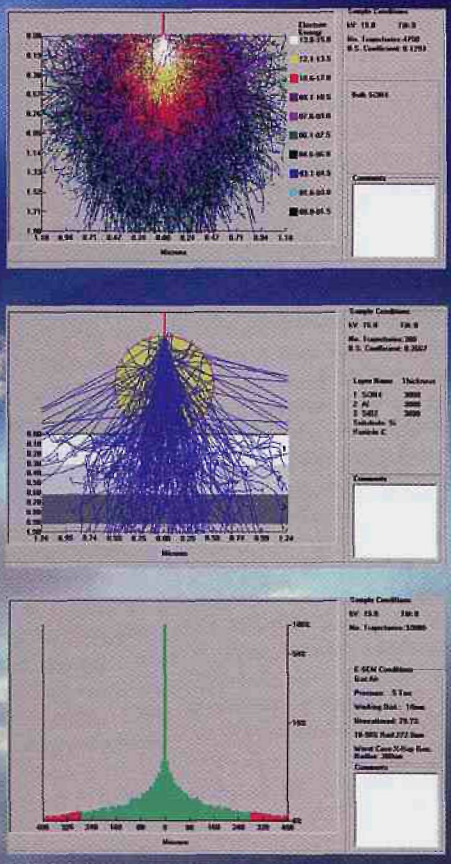
Model SEM and TEM samples and get better x-ray results with:

Bulk Samples
Semiconductors
Thin Films
Particles
Inclusions
Defects

Actually see x-ray resolution and E-SEM beam scatter, then adjust conditions to get better data

A great teaching tool

www.small-world.net
703-849-1492

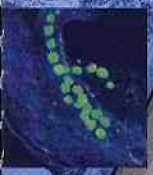


https://doi.org/10.1017/S1551929500054778 Published online by Cambridge University Press

https://doi.org/10.1017/S1551929500054778 Published online by Cambridge University Press

EXPANDING YOUR ACCESS TO THE THIRD DIMENSION IN TEM.

3D IMAGE OF COPPER CONTACT WITH SURROUNDING POROUS SiLK RESIN



3D IMAGE OF MAGNETOTACTIC BACTERIA USING XPLORE3D TEM

3D IMAGE OF FROZEN LIPOSOMES CONTAINING THE ANTI-CANCER DRUG DOXIL

SOFTWARE SOLUTIONS DELIVERING COMPLETE DATA EASILY.

By providing our people with an environment where innovative thinking and engineering excellence thrive, we are able to develop exciting new techniques and products that continually expand the possibilities in three-dimensional analysis and process control. The result is a suite of software solutions that give you easy access to complex three-dimensional data. Obtaining and presenting results in a three-dimensional and animated way, Xplore*3D*™ is the fast and reliable way to gain insight into complex structures analyzed on your Tecnai™ G² TEM. It is suited for 3D applications in life sciences, nanotechnology, materials sciences and semiconductor.

WELCOME TO FEI. INNOVATION IS OUR HERITAGE AND OUR FUTURE.

FEI Software

FEI COMPANY™
TOOLS FOR NANOTECH

WWW.FEICOMPANY.COM