

Imaging Application Note 2

Using Other Software with Imaging Workbench

Data can be exported from Imaging Workbench in a variety of formats, and can be imported and analyzed by a wide variety of other imaging and analysis software. For information on using Imaging Workbench with Clampex, see page 68, “Cooperative Imaging and Electrophysiology”.

Images

Bitmaps and Metafiles

You can obtain bitmaps (*.bmp) and metafiles (*.wmf) of images in Imaging Workbench by using the *Edit / Copy* command in an Acquisition or Playback window, which copies the current active View to the clipboard. Using *Edit / Copy* from the Statistics window, you can choose to copy the current view of the window as a bitmap or metafile. Use these images for display purposes only; they are unsuitable for data analysis.

TIFFs

Imaging Workbench exports TIFFs using the *File / Export* command. The TIFF file type is recognized by most graphics programs. The suite of Corel programs, CorelDraw and Corel Photopaint, and the Adobe programs, Illustrator and Photoshop, are two popular graphics packages that read and modify TIFFs; however, these images are only transferred as 8-bit images, independent of their original bit depth. Also, when exporting more than one image, Imaging Workbench creates a multi-image TIFF file, and not all graphics applications can read multi-image TIFFs.

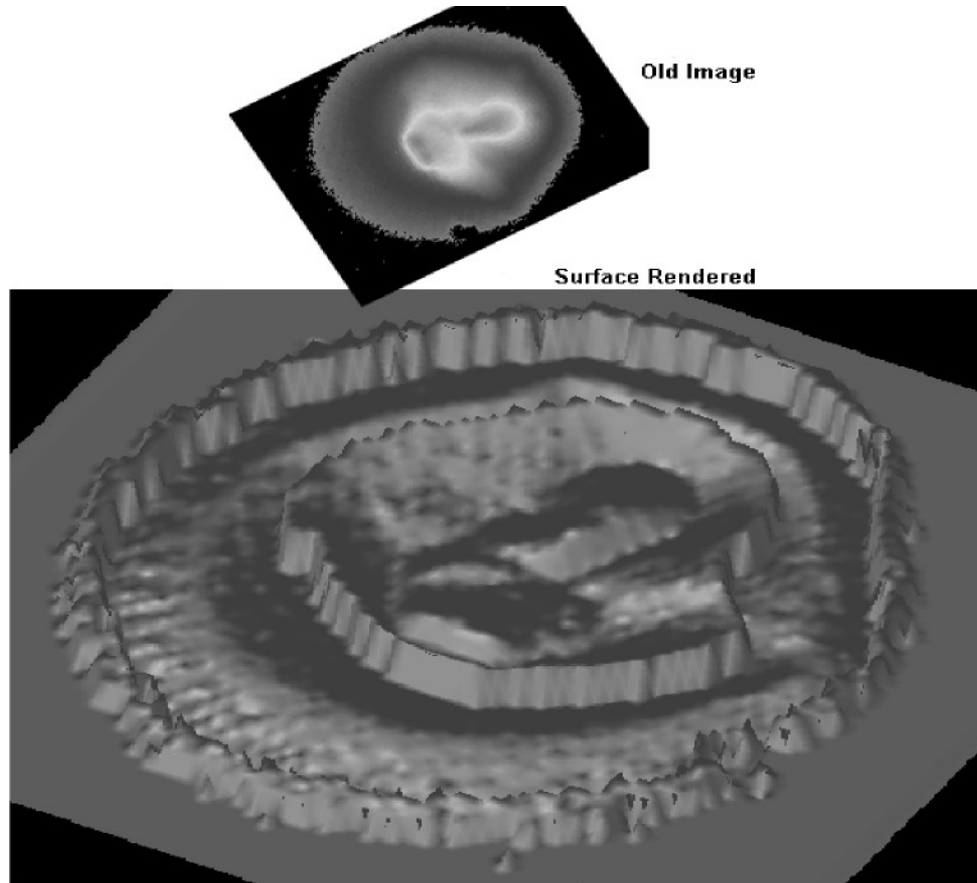
Raw Format (ARF) files

Imaging Workbench can export images in Raw Format File, which is a RAW image format, a headerless string of bytes specifying the value of up to three channels of interleaved image information. Adobe Photoshop is one program that can read ARF files (see “File Dialog” in the online Help for instructions on importing ARF files into Photoshop).

Advanced Analysis

For sophisticated numerical image analysis, advanced two-dimensional filtering, and three-dimensional shaded displays of images exported from Imaging Workbench, researchers might consider the range of options available in the Matlab environment from Mathworks, Inc. It is easy to export images from Imaging Workbench into this high-powered imaging analysis software. To do so,

perform a Copy Image command in the Edit menu to copy the displayed image to a BMP (Microsoft Windows Bitmap) file. With the command “readbmp (‘filename’)” in the Imaging Toolbox, available as an optional module in Matlab, the designated BMP file will be loaded as an ordinary matrix, upon which a wide range of numerical analyses can be performed. Here is an example of a Matlab-generated surface rendering of an image:



An alternative is to save images from Imaging Workbench in the ARF file format. You can then read this RAW file into MATLAB using ‘fopen’ and ‘fread’. (Otherwise save as RAW from Photoshop)

Another advanced scientific imaging program that can be used to enhance images from Imaging Workbench is Image-Pro Plus from Media Cybernetics. Included on the Imaging Workbench 5.0 CD is a plug-in for Image-Pro Plus. Once installed, it allows AXI files to be opened directly into Image-Pro Plus.

Numerical Data

Imaging Workbench Statistics window files contain data on the time dependence of intensity, ratio or ion concentration over one or more Analysis Regions of a preparation. This data, with a *.sta prefix and in ATF file format (see page 57),

can be imported directly into spread-sheet programs such as Microsoft Excel, Microcal Origin and Synergy Kaleidagraph, where they can be graphed.