

equiTexture User Manual

version 1.0b

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1. Introduction

equiTexture is a Macintosh program for making texture measurements using images created by most laboratory and consumer cameras. *equiTexture* uses algorithms developed specifically to obtain accurate, objective results. It achieves high throughput via a simple user interface.

equiTexture is a macro program running under the application *Equipoise-Image*, a descendant of *NIH Image* and *Object-Image*. *equiTexture* executes on all versions of Mac OS X in Classic mode, on Mac OS 8.6, and on all versions of Mac OS 9. All of the image manipulation tools available in *Equipoise-Image*, *NIH Image*, and *Object-Image*, are available to the *equiTexture* macros user.

The unregistered version of *equiTexture* implements a full set of quantitative measurement capabilities and a limited set of data export capabilities. It may be freely used and distributed.

Registered users have added data reporting capabilities, chiefly the export of measurements, results, and statistics from the analysis of multiple Regions-of-interest in spreadsheet format. Registration is accomplished by purchasing a license from Equipoise Imaging, LLC. License prices are:

individual user:	\$100.00
single lab site license (2 - 10 users):	\$250.00
unlimited departmental/divisional license:	\$500.00
unlimited institutional license:	\$1000.00

Registered users will receive further documentation and examples, and are entitled to minor upgrades. Visit the registration page at:

<http://www.eqpi.net/equiTexture/registration.html>

for instructions on registering your copy and receiving a full license.

2. Installation

Installation entails the following steps:

1. If you do not already have "Equipoise-Image" installed, download the Stuffit archive containing it from:

<http://www.eqpi.net/eqpi/equiTexture/registration.html>

and expand this archive onto your hard drive. This will create an "Equipoise-Image f" folder, containing the following files and folders:

Equipoise-Image 1.0 (application)

Macros folder (example macros based on the core features from NIH Image)

Keys folder (for keeping registration keys for Equipoise-Image macro programs)

Plug-ins folder (containing a single example plugin)

Kernels folder (containing filters)

2. Obtain the archive containing *equiTexture* from:

<http://www.eqpi.net/eqpi/equiTextureDL.html>

3. Using *equiTexture*: a brief tutorial

The following tutorial exercise will help familiarize you with *equiTexture*.

1. Double-click the "equiTexture1.0b-Loader.obj" file icon. This will launch Equipoise-Image and a dialog will open requesting you to navigate to and open the file "equiTexture 1.0b". This two-step process is necessary because "equiTexture1.0b-Loader.obj" initializes many *equiTexture* settings before it opens and runs the actual "equiTexture 1.0b" program. This step will also open a "LUT" window for manipulating the grayscale or color map that controls the on-screen appearance of pixels (the tall, thin window on the left side of the screen), a "Tools" palette containing a variety of image manipulation tools (to the right of the LUT window), an "Info" window (near the bottom left of the screen), a "Map" window for controlling the brightness and contrast of images, and a "Dialog" window for adjusting the step size parameter and number of bins used to compute the co-occurrence matrix..

2. Use the "File>Open" menu item to navigate to and open a TIFF image that you would like to analyzed. Many other image formats may be accessed using the "File>Import" menu item - see the documentation for NIH Image at the URL in section 4 below for details.
3. Using one of Equipoise-Image's region-of-interest (ROI) selection tools. These include the rectangle ROI, oval ROI, polygon ROI, and freehand (drawn) ROI tools shown in upper right of the "Tools" palette.
4. Adjust the value of the step size parameter and the number of bins using the slider tool and checkboxes in the "Dialog" window. These have default values of 1 and 8, respectively. These values may be changed at any time.
5. Press the [F5] function key. This will initiate the analysis, which completes in less than 1 second.
6. If desired, change the step size and number of bins, and repeat steps 5 - 6 for each ROI that you would like to measure. Notice that numbered results windows are created for each ROI that is measured.
7. Select the "Objects>Show Obj. Results" menu item. This will open the "Object Results" datasheet, which contains all of the measured and calculated results. Click on one of the entries in the "RoiArea" column and look back at the image you opened. Notice that the numeral identifying the ROI associated with this row of data is now emphasized in the image, and that the rectangular marker for it is now filled. Do this for other entries in the "RoiArea" column. This operation allows the user to browse particular entries in the datasheet and easily identify the associated ROI in the image. Now go to the "Tools" palette and select the "finger" tool near the bottom right. Go back to the image window and click on one of the rectangular markers on an ROI that has been measured. This will select that particular ROI (evident by its emphasized number and marker) so that its data may be identified in the Object Results datasheet.
8. At the left of the "Object Results" datasheet, click on the double-headed "Statistics" arrow to select which statistics are calculated and displayed for each numerical measurement column.
9. With one of the ROIs selected (via either method of step 8), press the [F10] function key. This

will remove the selected ROI from the list of measured ROIs, delete all measurements made from it, and dispose (without saving) the individual result window associated with it. The remaining ROIs are then renumbered and their summary statistics recalculated.

10. When you are finished, save the individual results windows (as TEXT files) that you wish to retain. In the registered version of *equiTexture*, the datasheet containing results from an entire set of measured ROIs may be exported as a tab-delimited text file for use by a spreadsheet, database, or word processing application.

11. To perform additional analyses using a different image, close the completed image, save or dispose of all open data windows, and use the "Special>Reset" menu item to reset *equiTexture* to its initial state. Open a new image, and repeat steps 3 - 10.

4. Resources and related information

NIH Image homepage: <http://rsb.info.nih.gov/nih-image/>
- the home of the whole *Image* family, laden with information and related software

Object-Image homepage: <http://simon.bio.uva.nl/object-image.html>
- especially useful for familiarization with *Object-Image*

Equipoise-Imaging homepage: <http://www.eqpi.net/eqpi/>
- examples, macros, and related software

Please contact us at:

equipoise@rcn.com

with questions, comments, or suggestions. Your feedback is vital to our continuing work to improve *equiTexture's* usability and performance and to add features requested by users.