WIN32TRACE USER MANUAL

V1.4.0

Table of Contents

1. Introduction

1.1 Getting Started

Win32Trace is a program for converting raster (bitmap) graphics into vector (tracing) formats. It wraps the console application AutoTrace in a convenient Windows GUI and uses the FreeImage graphics library to import a wide variety of raster image formats.

Features of Win32Trace

Win32Trace presents a graphical user interface for interactively converting raster files to vector format. You can:

- Import raster (and vector) files from the clipboard
- Save converted images to a variety of vector file formats
- Determine vector properties by adjusting despeckling, noise, line properties
- Zoom specific regions of the vector image
- Save and retrieve customized conversion settings

A sample screen of a **Win32Trace** session is shown below:

1.2 FAQ

Common terminology used in converting raster (bitmap/jpg/png) files into vector graphics are presented below:

Background color

The color of the background that should be ignored.

Centerline

Trace a character's (or pattern's) centerline, rather than its outline.

Color Count

This sets the number of colors that the output file will contain. Maximum allowable is 256 (which is a lot). Setting this to 0 will perform no color reduction.

With vector graphics, the final file size is related to the image complexity. The greater the number of colors, the larger the file size will be because more color primitives (vectors) will be needed.

For best results, use the smallest number of colors that produce a satisfying vector image. For monochrome images, use color count = 2. For grayscale image, use color count = 0.

Corner Always Threshold

This setting (angle in degrees) forces a pixel to be marked as a corner even if it is right next to another pixel marked as a corner. Default is 60.

Corner Surround

This is the number of pixels on either side of a point to consider when determining if that point is a corner. The default is 4.

Corner Threshold

This setting (angle in degrees) determines if a pixel is marked as a corner. If a pixel, its predecessor(s), and its successor(s) meet at an angle smaller than this, it is marked as a corner. Default is 100.

Despeckle Level

This sets the degree to which Autotrace blurs regions with similar colors when searching for edges. Too little despeckling will cause your image to have wiggly vectors caused by discrete pixels; too much and your image may turn out looking blurred beyond recognition.

Error Threshold

This setting controls the subdivision of fitted curves. To achieve a closer approximation to the original curve, use lower values for this. Pixels that depart by more pixels than this from the original curve will force subdivision of the spline. Default is 2.0.

Filter Iterations

This sets the number of times curves will be smoothed before fitting to a spline. Default is 4.

Line Reversion Threshold

The line reversion threshold attempts to do the same thing as Line Threshold: reduce nearly-straight spline curves to simpler lines. But whereas Line Threshold simply judges the distance between the curve and its straight line, Line Reversion Threshold weights this measurement by the length of the spline. Default is 0.01.

Line Threshold

If the spline curve approximation for a vector is not more than this distance (in pixel units) away from the straight line defined by its endpoints, then the curve will be simplified to a straight line. Default is 1.

Preserve Width

This setting preserves the width of lines when using the Centerline option. The default is to thin them.

Remove Adjacent Corners

Remove corners that are next to each other.

Tangent Surround

The number of points on either side of a point used to compute the tangent vector at that point. Default is 3.

Trace Center Lines

When this option is selected, the workflow traces region centerlines rather than the regions themselves. This is generally not useful for image transformation, but is however sometimes helpful when looking for text within an image

Width Weight Factor

This setting influences the extent to which line width influences the vectorization when deciding which line segments to join together.

Commands

[File menu](#)

[Edit menu](#)

[View menu](#)

[Help menu](#)

2. Menus

2.1 File menu

New   Opens a new Win32Trace editing session, keeping the present one open.

Open   Opens an existing document.

Save   Saves present document.

Save As   Saves an opened document to a specified file name.

Close   Closes current document.

MRU List   Shows list of recently used documents.

Exit   Exits Win32Trace.

2.2 Edit menu

Paste   Pastes raster data from the clipboard into the Win32Trace viewing pane.

Copy   Copies data onto clipboard

Save Settings   Saves present conversion settings in a custom settings file for later use.

Restore Settings   Retrieves and applies settings previously saved in a custom settings file.

2.3 View menu

Zoom Out   Magnifies view of image

Zoom In   Decreases size of image

Toolbar   Shows or hides the toolbar.

Status Bar   Shows or hides the status bar.

2.4 Help menu

The Help menu offers the following commands, which provide you assistance with this application:

Help Topics   Offers you an index to topics on which you can get help.

Help Manual   Displays the help manual.

About   Displays the version number of this application.

3. File menu

3.1 New

Use this command to open a new editing session. The current session file remains open. You can switch working sessions from the Windows menu.

3.2 Open

Use this command to open an existing raster and view it in a new window. You can only open a single document at a time for tracing.

Use the Paste command to copy a raster (or vector) file from the clipboard.

Shortcuts

Toolbar:

Keys: CTRL+O

3.3 Save

3.4 Save As

Use this command to save and name the active document. Win32Trace displays the Save As dialog box so you can rename your document and choose the vector graphics format for the saved file.

To save a document with its existing name and directory, use the Save command .

3.5 Close

Use this command to close the active window.

Double-clicking a Control-menu box is the same as choosing the Close command.

Note: If you have multiple windows open for a single document, the Close command on the document Control menu closes only one window at a time. You can close all windows at once with the Close command on the File menu.

Shortcuts

Keys: CTRL+F4 closes a document window

ALT+F4 closes the Win32Trace window

3.6 MRU List

Use the numbers and filenames listed at the bottom of the File menu to open the last four documents you closed. Choose the number that corresponds with the document you want to open.

3.7 Exit

Use this command to end your Win32Trace session. You can also use the Close command on the application Control menu. Win32Trace prompts you to save documents with unsaved changes.

Shortcuts

Mouse:Double-click the application's Control menu button.

Keys: ALT+F4

4. Edit Menu

4.1 Paste

Use this command to insert a copy of the clipboard contents into the raster view window. This command is unavailable if the clipboard is empty. This is one way of importing unsupported file types (such as vector format files, for example) into Win32Trace, using an editor that can read the input file and export it as a bitmap (or metafile) through the clipboard.

Shortcuts

Toolbar:

Keys:CTRL+V

4.2 Copy

4.3 Save Settings

Saves present conversion settings in a settings file for retrieval.

4.4 Restore Settings

Restores conversion settings that were previously stored in a settings file.

5. View menu

5.1 Zoom out

Zoom out decreases the magnification (by 2X) of the vectorized image each time it is clicked. It is the inverse of the zoom in operation.

Shortcuts

Toolbar: Click the application's Zoom-out menu button.

5.2 Zoom In

Zoom in magnifies (by 2X) the view of the vectorized image each time it is clicked. (Note, however, that the actual vector image size is left unchanged.) The position of the viewable area of the vector image can be changed by moving the mouse over the raster image to the desired coordinates.

Shortcuts

Toolbar: Click the application's Zoom-in menu button.

5.3 Status Bar

Use this command to display and hide the Status Bar, which describes the action to be executed by the selected menu item or depressed toolbar button, and keyboard latch state. A check mark appears next to the menu item when the Status Bar is displayed.

See Status Bar for help on using the status bar.

5.4 Toolbar

Use this command to display and hide the Toolbar, which includes buttons for some of the most common commands in Win32Trace, such as File Open. A check mark appears next to the menu item when the Toolbar is displayed.

See Toolbar for help on using the toolbar.

6. Windows menu

6.1 New

Use this command to open a new window with the same contents as the active window. You can open multiple document windows to display different parts or views of a document at the same time. If you change the contents in one window, all other windows containing the same document reflect those changes. When you open a new window, it becomes the active window and is displayed on top of all other open windows.

6.2 Cascade

Use this command to arrange multiple opened windows in an overlapped fashion.

6.3 Tile

Use this command to arrange multiple opened windows in a non-overlapped fashion.

6.4 1,2,...

Win32Trace displays a list of currently open document windows at the bottom of the Window menu. A check mark appears in front of the document name of the active window. Choose a document from this list to make its window active.

7. Help menu

7.1 Help Topics

Use this command to display the opening screen of Help. From the opening screen, you can jump to step-by-step instructions for using Win32Trace and various types of reference information.

Once you open Help, you can click the Contents button whenever you want to return to the opening screen.

7.2 Help Manual

Use this command for a glossary of terms used in Win32Trace.

7.3 About

Use this command to display the copyright notice and version number of your copy of Win32Trace.

7.4 Context Help

Use the Context Help command to obtain help on some portion of Win32Trace. When you choose the Toolbar's Context Help button, the mouse pointer will change to an arrow and question mark. Then click somewhere in the Win32Trace window, such as another Toolbar button. The Help topic will be shown for the item you clicked.

Shortcut

Toolbar:

Keys: SHIFT+F1

8. Editing Tools

8.1 Centerline

Choose this option to drawn the centerline - rather than the outline - of the drawing. This is particularly useful for tracing line drawings (refer to the "outline" sample in the Examples folder, and load the "outline.csf"settings file to see the settings that were used for this case).

8.2 Corner Always Threshold

An angle (in degrees, real number) used, in conjunction with the "corner threshold" to define a corner in Autotrace. If the angle at a pixel is less than this value, it is considered a corner, even if it is within "corner-surround" pixels of another corner (default value = 60).

8.3 Corner Surround

Number of pixels around a given point used to determine if that point is a corner (default value = 4).

8.4 Corner Threshold

An angle (in degrees, real number) used to define a corner in AutoTrace. If a pixel, its predecessor(s) and its successor(s) meet at an angle smaller than this value, it is deemed to be a corner (default value = 100).

A point is consider by AutoTrace to be a corner if (1) the angle defined by the "corner surround" points coming into it and going out from it is less than this "corner threshold" (in degrees), and no point within "corner surround" points has a smaller angle; or (2) the angle is less than "corner always threshold" (in degrees).

8.5 Curve Fit Threshold

If the maximum distance (in pixels) between the fitted curve and the original curve exceeds this value (real number), then the fitting spline will be subdivided (default value = 2.0).

8.6 Despeckle Level

Despeckling is the process of removing feature contours that enclose only a few pixels. An increase of the despeckling level by one doubles the size of features that are resolved. The default value for this parameter is zero (no despeckling). Increasing this parameter will generally decrease both the number of vectors and the size of the resulting vector file, at the cost of gradually smoothing out global features and reducing the number of distinct colors in the vectorized image.

8.7 Feature Blending

Together with the despeckle level (which must be set to a non-zero value for this feature to be operative), the value of this parameter determines how neighboring pixels will be merged to define a vector contour. Larger values tend to blur individual features more, while smaller (tighter) values allow for more detail to be retained in the final tracing.

8.8 Line Threshold

If the spline is not more than this distance in pixels (real number) from the straight line defined by the spline endpoints, then a straight line is output, rather than a spline (default value = 1.0).< /FONT >

8.9 Line Width Weight

Weight factor (real number) for fitting the line width (default value = 6.0).

8.10 Median Filter

Click this button to reduce pixel-to-pixel noise using an image *median filter*. This is an adjunct to [despeckling](#) to reduce the pixelation of the image and make it smoother prior to vectorization.

8.11 Palette

Click this button to open a color palette for choosing the background image color that will be ignored during processing.

8.12 Preserve Line Width

Choose this option to preserve line width prior to contour thinning during [centerline](#) fitting.

8.13 Reduce Color Count

Click this button to reduce the color count to the number entered. A sophisticated *color quantization* is applied to reduce the number of colors and preserve as much of the image detail as possible.

8.14 Remove Adjacent Corners

Choose this option to remove adjacent corners. This prevents two corners from being next to each other, which is desirable to assure the continuity of the curve fit.

8.15 Vectorize

Click this button to convert the raster image into a vectorized image. This allows you to view the vectorized image *before* you [save](#) it to a vector format file. The process may require several iterations with various settings changes before you arrive at a suitable vector image that you want to save.

9. Dialogs and Toolbars

9.1 File Open

The following options allow you to specify which file to open:

File Name

Type or select the filename you want to open. This box lists raster (bitmap) files with the extension you select in the List Files of Type box.

List Files of Type

Select the type of raster file you want to open. The supported file types are:

*.bmp; *.gif; *.jpg; *.ico

Drives

Select the drive in which Win32Trace stores the file that you want to open.

Directories

Select the directory in which Win32Trace stores the file that you want to open.

9.2 File Save As

The following options allow you to specify the name and location of the file you're about to save:

File Name

Type a new filename to save a document with a different name. Win32Trace adds the extension you specify in the Save File As Type box.

Save In

Select the drive and folder in which you want to store the document.

Save As Type:

Win32Trace allows you to save the vector graphics file in a variety of different formats:

File Type	Extension
Encapsulated PS	EPS
Adobe Illustrator	AI
Computer Graphics Metafile	CGM
Enhanced Metafile	EMF
Windows Metafile	WMF
HP Plotter File	PLT
Scalable Vector Graphics	SVG
Drawing Interchange File	DXF
Portable Document Format	PDF

9.3 Main Toolbar

The toolbar is displayed across the top of the application window, below the menu bar. The toolbar provides quick mouse access to many tools used in Win32Trace,

To hide or display the Toolbar, choose Toolbar from the View menu (ALT, V, T).

ClickTo

Open a new document.

Open an existing document. Win32Trace displays the Open dialog box, in which you can locate and open the desired file.

Save the active document or template with its current name. If you have not named the document, Win32Trace displays the Save As dialog box.

Print the active document.

Remove selected data from the document and stores it on the clipboard.

Copy the selection to the clipboard.

Insert the contents of the clipboard at the insertion point.

9.4 Status Bar

The status bar is displayed at the bottom of the Win32Trace window. To display or hide the status bar, use the Status Bar command in the View menu.

The left area of the status bar describes actions of menu items as you use the arrow keys to navigate through menus. This area similarly shows messages that describe the actions of toolbar buttons as you depress them, before releasing them. If after viewing the description of the toolbar button command you wish not to execute the command, then release the mouse button while the pointer is off the toolbar button.

The right areas of the status bar indicate which of the following keys are latched down:

Indicator	Description
CAP	The Caps Lock key is latched down.
NUM	The Num Lock key is latched down.
SCRL	The Scroll Lock key is latched down.