

Wise ways with images

By
 technical
 editor
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WiselImage is basically a program for editing raster images, but that brief description fails to indicate its breadth of scope and power.

Its name, 'wise-image', is quite apt, because it embodies considerably more understanding of the form of the images than would normally be expected in a raster image program.

In other words, WiselImage has enough 'wisdom' to allow it to recognise geometric objects (such as circles for example) that would normally only be possible with vector graphics, and to handle them as self-contained drawing objects as is done in vector drawing or CAD programs. The makers say: "WiselImage introduces true CAD-style editing of raster images."

As may be expected from being able to recognise geometric objects among the mass of raster dots, WiselImage also has the ability to convert those geometric objects into true vector form. Hence its makers describe WiselImage as a hybrid graphics editor and raster-to-vector convertor.

Unlike most raster editing programs, WiselImage can handle very large formats, and has special features designed to manipulate scanned technical drawing data and manage its transition to CAD design work.

Its producer, Consistent Software, is a Russian company dedicated to raster and hybrid graphic manipulation. They began in 1990 and quickly gained a reputation as a leading world expert in the field with their Rasterex products. Consistent Software's products are marketed through Consistent Software International, based in Norway, and are represented in Australia by RasterTech Pty Ltd in Sydney.

WiselImage is offered as an independent program that runs as a Windows application, and also as a version to run inside AutoCAD and AutoCAD LT, where it enables scanned



images to be merged with CAD data and all or parts of the raster data to be converted to AutoCAD drawing objects.

The stand-alone Windows version can export its vectorised data to any CAD system via the common DXF data format. Each of those two versions is offered in standard and 'Pro' editions, making four versions altogether. The Pro versions of course have a wider range of facilities.

System's capabilities

The system's capabilities can be grouped under nine headings:

Raster correction tools: adjust colour balance and contrast, monochrome contrast and gamma, cropping, rotation, resizing, de-speckling, de-skewing, and advanced distortion adjustments (calibration) for correcting linear and non-linear distortions or apply controlled distortion to fit raster features to known positions.

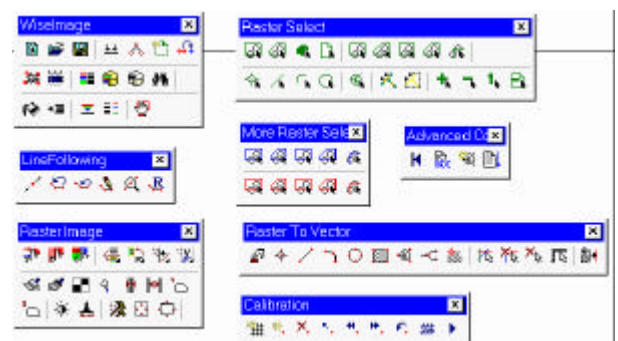
The options for this are numerous and include very complex methods – by grid or arbitrary set of points, grid adaptive bilinear, line conformal, Affin algorithm, bilinear, polynomial 2-6 degrees. The system or the operator can choose the optimal method and it can give an accuracy estimate.

Raster Objects and Hybrid Graphics: Raster editing tools normally are restricted to working on regions defined by the operator or sometimes on regions of one colour enclosed by different coloured regions.

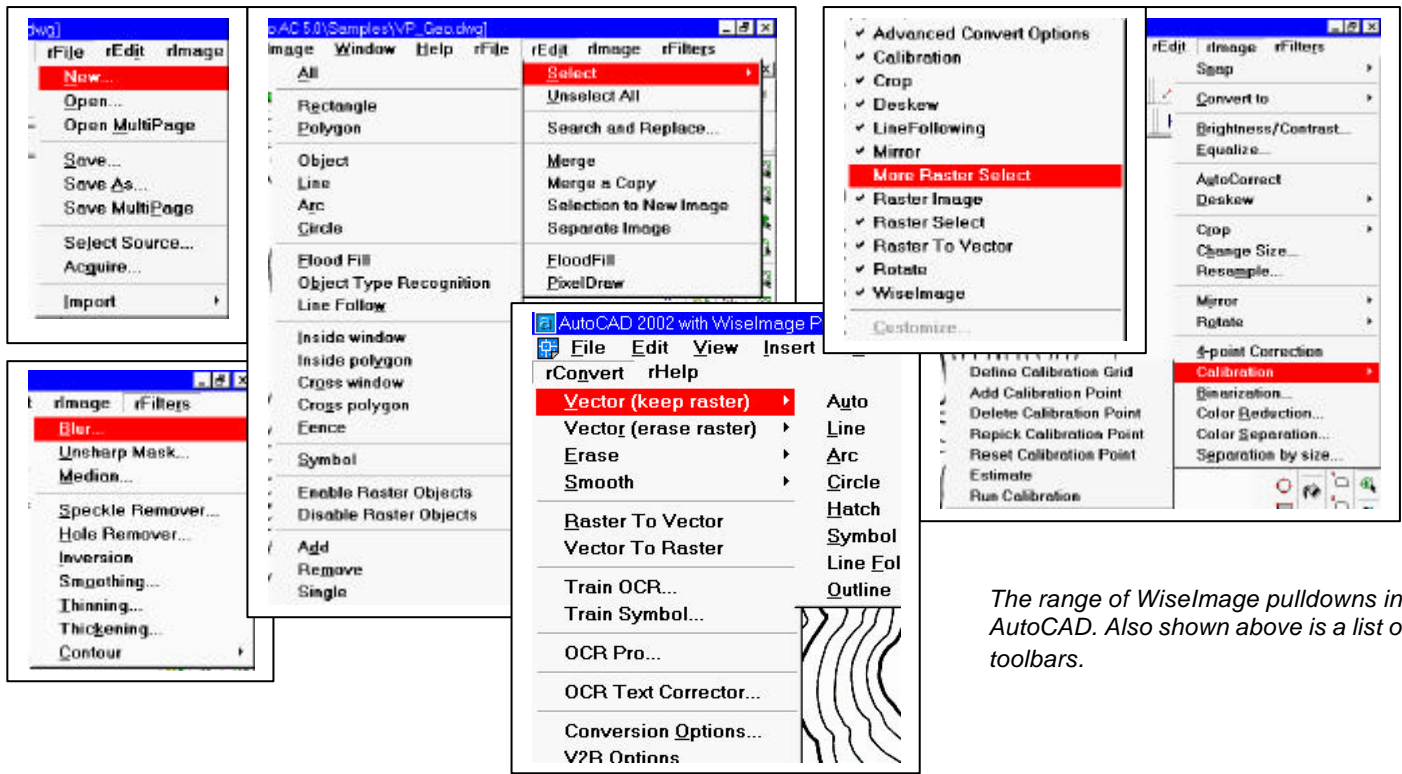
However, WiselImage can recognise patterns of abutting dots that a human also interprets as geometric figures such as lines, arcs, and circles.

It can then edit those objects in much the same way as a CAD or vector tool – resizing, moving or reshaping the geometry, altering the line width, line-type and colour, and regularising the typically somewhat 'ragged' nature of a raster representation of a geometric object.

'Grip' editing of geometric figures is supported, as in most vector and CAD products.



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The range of WiselImage pull-downs in AutoCAD. Also shown above is a list of toolbars.

Symbols: WiselImage has a library of symbols in vector form, and can match those against dot patterns in the raster image, and convert the recognised regions to true vector elements. This recognition can cope with different scales of symbols and rotation.

Users can add more symbols and train the system to recognise those added symbols. The Symbol Recognition can be done in semi-automatic mode (through tracing) and automatically.

Layering: Layers can be used to segregate graphic objects, raster or vectorised, according to their colour or grey values. This is particularly useful for scans of coloured maps, where the coloured lines can be vectorised (if desired) and segregated on layers so that, for example, separate plates could be made for colour printing presses.

Raster-to-Vector conversion (Semi-Automatic):

The standard versions provide facilities for manually tracing over raster images to create vector objects.

In addition, WiselImage can automatically convert recognised objects when the operator points to them, which they refer to as 'semi-automatic', because it requires the user to control the process.

Tracing over visible lines in the raster does not require precise tracing as the system can smooth the semi-automatically traced centrelines of the aggregations of dots making up the lines. It can also convert hatched areas.

Raster-to-Vector Conversion (Automatic):

This is only provided in the Pro versions. Automatic means the system works by itself converting all objects that it can recognise in the entire image. This can include symbol recognition.

Raster-to-Vector Conversion in AutoCAD:

The AutoCAD versions of WiselImage extend the conversion facilities by converting features directly into AutoCAD drawing objects within the DWG file. It

recognises lines, arcs, circles, polylines, splines, symbols, points, text and hatches.

As in the stand-alone Windows versions, manually guided conversion is provided in the standard version and fully automatic operation in addition, in the Pro version.

Text Recognition: Vector conversion of text in many systems is very often rather useless because the strokes making up characters are converted to lots of very small lines, often rather irregularly arranged. This feature matches raster images of text characters against its library of fonts (that is, OCR, or Optical Character Recognition) and substitutes AutoCAD Text objects with similar font style and size.

The supplied character template libraries that allow recognize the characters of English alphabet, punctuation marks and special symbols. At the same time WiselImage OCR module can be trained to recognize any character.

Vector Enhancement Tools (Pro versions): Human operators can invariably see ways of refining the automatically vectorised data, and these tools allow various types of 'tweaking' to be done semi-automatically. These include merging of line-fragments, re-aligning intersections (often distorted as a result of 'blobbing' of the scanned lines), de-speckling by removal of very small disconnected items.

Data Formats

The Windows versions can read raster images in many common and not-so-common file formats.

These include TIFF (many variants including multi-page), RLC, BMP, JPEG, PCX, CAL, GP4, TG4, CT4. They can import data from AutoCAD DWG and DXF files for versions R14 to 2002, MicroStation DGN and previous Rasterex formats. They can export to DWG/DXF R14-2002, Mapinfo's MID, and Rasterex formats.

The AutoCAD versions can use any raster format that AutoCAD supports. They are ARX add-in applications and work with AutoCAD versions 2000, 2000i and 2002

and also with LT 2000, 2000i and 2002.

WiselImage Pro for AutoCAD

The AutoCAD versions add several extra pull-down menus, the name of each prefixed with a lower-case 'r' for 'raster'. The full-screen image (*previous page*) shows the extra pull-downs and also all the extra toolbars, docked mainly the right-hand side, but with some of the smaller ones filling in blank spaces elsewhere.

This was done here to show all the toolbars. It would not be necessary to have all toolbars displayed normally. The work area shows a typical scanned drawing, prior to being worked upon with the WiselImage tools.

The scope of the tools available can be seen from the names of the menus, and each of the WiselImage pull-downs is shown here. The extra menu overflow onto a second row unless you use a Windows screen resolution of at least 1152 x 864 as shown here.

Summary

WiselImage is a very powerful and complete solution for making best use of scanned drawing data in a CAD environment. Its interactive controls allow you to choose what combination of raster and vector data to employ in the final result.

Sometimes it is not necessary to vectorise completely. Its calibration tools provide an impressive array of powerful methods for matching scanned drawings or aerial photographs to accurate survey or CAD data. The fact that WiselImage for AutoCAD can be used with LT makes for a very powerful yet cost-effective system.

Exactly the same functionality is provided for LT as for full version of AutoCAD, which is remarkable facility.

They call the licensing scheme '3-in-1', because it allows the use of WiselImage in AutoCAD, AutoCAD LT and Windows.

This is a very impressive set of products.

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