

## MatrixGaussJ

sharpenmore	3x3 sharpening filter= (9*center-outer).
thin	Calculates binary image thinning using neighborhood maps based on the algorithm in <i>Graphics Gems IV</i> , p. 465. <b>Note:</b> The thin keyword to MatrixFilter will be removed someday. The functionality will be available — just not as a part of MatrixFilter. The /R flag does not apply to the lame duck thin keyword.

### Flags

/B=b	Specifies value that is considered background. Used with thin. If object is black on white background, use 255. If object is white on a black background, use 0.
/F=value	Specifies the value in the ROI wave that marks excluded pixels. <i>value</i> is either 0 or 1. This flag was added in Igor Pro 7.00. By default, and for compatibility with Igor Pro 6, <i>value</i> =0. Use /F=1 if your ROI wave contains 1 for pixels to be excluded.
/M=rank	Assigns a pixel value other than the median when used with the median filter. Valid <i>rank</i> values are between 0 and $n^2-1$ (for the default median <i>rank</i> = $n^{2/2}$ ).
/N=n	For any method described above as “nxn”, you can specify that the filtering kernel will be a square matrix of size <i>n</i> . In the absence of the /N flag, the default size is 3.
/P=p	Filter passes over the data <i>p</i> times. The default is one pass.
/R=roiWave	Only the data outside the region of interest will be modified. <i>roiWave</i> should be an 8-bit unsigned wave with the same dimensions as the data matrix. The exterior of the ROI is defined by zeros and the interior is any nonzero value.
/T	Applies the thinning algorithm of Zhang and Suen with the thin parameter. The wave M_MatrixFilter contains the results; the input wave is not overwritten.

### Details

This operation does not support complex waves.

### See Also

**ImageFilter** operation for additional options. **Matrix Math Operations** on page III-138 for more about Igor’s matrix routines. The **Loess** operation.

### References

Heckbert, Paul S., (Ed.), *Graphics Gems IV*, 575 pp., Morgan Kaufmann Publishers, 1994.

Zhang, T. Y., and C. Y. Suen, A fast thinning algorithm for thinning digital patterns, *Comm. of the ACM*, 27, 236-239, 1984.

## MatrixGaussJ

### MatrixGaussJ *matrixA*, *vectorsB*

The MatrixGaussJ operation solves matrix expression  $A^*x=b$  for column vector *x* given matrix *A* and column vector *b*. The operation can also be used to calculate the inverse of a matrix.

### Parameters

*matrixA* is a NxN matrix of coefficients and *vectorsB* is a NxM set of right-hand side vectors.

### Details

On output, the array of solution vectors *x* is placed in M\_x and the inverse of *A* is placed in M\_Inverse.

If the result is a singular matrix, V\_flag is set to 1 to indicate the error. All other errors result in an alert, and abort any calling procedure.

All output objects are created in the current data folder.

An error is generated if the dimensioning of the input arrays is invalid.