minimum energy configuration is usually time consuming and it strongly depends on the format of the energy function and the initial conditions (as defined by the starting snake). The operation computes the energy as a sum of the following 5 terms:

1. The coefficient alpha times a sum of absolute deviations from the average snake segment length. This term tends to distribute the vertices of the snake at even intervals.

2. The coefficient beta times a sum of energies associated with the curvature of the snake at each vertex.

3. The coefficient gamma times a sum of energies computed from the negative magnitude of the gradient of a Gaussian kernel convolved with the image. This term is usually referred to in the literature as the external energy and usually drives the snake to follow the direction of high image gradients.

4. The coefficient delta times a repulsion energy. Repulsion is computed as an inverse square law by adding contributions from all vertices except the two that are immediately connected to each vertex. This energy term is designed to make sure that the snake does not fold itself into "valleys".

5. The coefficient eta times the sum of values corresponding to the positions of all snake vertices in the wave you provide in /EXEN.

The energy calculation skips all terms for which the coefficient is zero. In addition there is a built-in scan which adds a very high penalty for configurations in which the snake crosses itself.

ImageSkeleton3D

ImageSkeleton3D [/DEST=*destWave* /METH=*method* /Z] *srcWave*

The ImageSkeleton3D operation computes the skeleton of a 3D binary object in srcWave by "thinning". Thinning is a layer-by-layer erosion until only the "skeleton" of an object remains. (See reference below.) It is used in neuroscience to trace neurons.

The ImageSkeleton3D operation was added in Igor Pro 7.00.

Parameters
srcWave is a 3D unsigned-byte wave where object voxels are set to 1 and the background is set to 0.

Flags

/DEST=*destWave*	Specifies the wave to contain the output of the operation. If the specified wave already exists, it is overwritten.
	When used in a user-defined function, ImageSkeleton3D creates wave reference for *destWave* if it is a simple name. See **Automatic Creation of WAVE References** on page IV-72 for details.
	If you omit /DEST the output wave is M_Skeleton in the current data folder.
/METH=*m*	Sets the method used to compute the skeleton.
	m=1: Uses elements of an algorithm by Kalman Palagyi (default).
	This is currently the only supported method.
/Z	Do not report any errors.

Details
The output is stored in the wave M_Skeleton in the current data folder or in the wave specified by /DEST.

Skeleton voxels are set to the value 1 and background voxels are set to 0.

Example
```
// Create a cube with orthogonal square holes
Make/B/U/N=(30,30,30) ddd=0
ddd[2,27][2,27][2,27]=1
ddd[2,27][10,20][10,20]=0
ddd[10,20][2,27][10,20]=0
ddd[10,20][10,20][2,27]=0
ImageSkeleton3D ddd
```

See Also
Chapter III-11, **Image Processing**, **ImageMorphology**, **ImageSeedFill**