Process Description:

Windowing is a very complex process. You should definitely as Hunter about it.

Parameter Descriptions:

Input Channels:

This allows you to select which mask channels you want to use for windowing. If multiple channels are selected, the intersection of the masks will be used. Select the channels by clicking on them in the "Available Input Channels" box and then clicking "Select>" to move them to the "Selected Channels" box. You can unselect a channel by clicking the "Delete" button

Mask process to be used for windowing:

This allows you to select a mask process from the drop-down menu for windowing. If choosing "Select later" and more than one process exists, you will be asked at runtime which mask process to use.

Minimum size of objects to window:

The masks box lists the channels where masks are available from the previous mask processes. One or several masks can be selected and used for speckle detection. If several mask channels are selected, the intersection of the computed masks is computed for each frame and then used for speckle detection.

Window size

Theses two edit boxes allow you to specify the size in pixels of the windows **parallelly to the mask edge** and **perpendicularly to the mask edge**. If the pixel size of the movie has been entered, the size of the window in microns will be displayed in the corresponding gray box.

Note that depending on the **Method to use to propagate the windows from one frame to another,** the windows may only be exactly this size at the first frame of the movie and frames where re-initialization occurs (see method and re-initalization descriptions below).

Window origin

After clicking on **Select a position for the origin of the windows**, a window will pop-up with a cursor allowing to select a position on the image. The coordinates of the cursor will be displayed in the edit box. Check **Use this location as the origin of the windows i**f you want to use this position as the origin of windows, i.e. the window of coordinates (1,1),

Method to use to propagate the windows from one frame to another

Use the drop-down menu to select a propagation method. Currently available methods include

- **Constant number:** These windows are drawn time-independently in each frame. The width of the windows at the mask edge (or at the depth specified by the origin of the windows) will always be equal to the window size parallel to the mask edge (see above). To maintain this constant width, the number of windows will vary as the length of the mask edge varies. That is, if the mask edge length increases the number of windows will increase. The windows will always occupy a constant distance from the mask edge

- **Constant width:** The windows are drawn time-independently in each frame by dividing the mask edge up into a constant number of segments. Their size in the direction parallel to the mask edge will therefore be proportional to the length of the mask edge divided by nWinPerp. Therefore their width will vary as the length of the mask edge varies. The windows will always maintain a constant distance from the mask edge.

- **Protrusion based**: The outermost band of windows will follow the protrusion vectors for the mask edge. The protrusion calculations must already have been run. The inner bands of windows will still be based on maximal gradient ascent of the distance transform, using the outermost windows for start points. The windows are time-dependent and may change width along the mask edge or even collapse to lines during the movie depending on how the mask moves/changes shape and the algorithm used to calculate the protrusion vectors. However, the windows will still always occupy a constant distance from the mask edge.

- **PDE based**: The protrusion vectors are used as a boundary condition to solve a PDE in the mask interior. This allows the protrusion vectors to be 'interpolated' into the interior of the mask and all of the windows then follow this vector field. Using this method the windows are time-dependent and will change both their width along the mask edge AND their width perpendicular to the cell edge. As a result they will NOT occupy a constant distance from the mask edge if it is moving.

If **Periodically re-initialize windows to their starting size** is checked, you can specify the **Number of frames to propagate windows before re-initializing them** to their starting sizes/number. Note that this option will have no effect on the time-independent window propagation methods (Constant Width, Constant Number)

References

Hunter super cool methods paper