Sherlock 7 Technical Resource

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Industrial Products

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Pattern Generators

Sherlock 7 has built-in pattern generators. These Preprocessors usually begin with the "Draw". For example, the above image shows the "Draw Gaussian" pattern generator as applied to the DALSA logo.

Draw Bars [Preprocessor]

The Draw Bars preprocessor generates edges (bars) with sub-pixel (less than 1 pixel) location and with options to simulate optical blur, non-uniform pixel sensitivity, and low-pass filtering by the processing electronics. This pattern generator is useful in testing edge detectors and spatial frequency filters (such as a sharpening filter).

Bars are always drawn vertically in a rectangular ROI. Rotating the ROI allows different edge angles to be tested. However, rotated ROIs (other than 0, 90, 180, and 270 degrees) will have additional errors due to Sherlock's interpolation of the images.

The parameters are in three groups: Bar Parameters, Space Parameters, and Sampling Parameters.

Bar Parameters set the starting position, width and amplitude of the bars. The ***start*** parameter sets the first bar starting location with sub-pixel precision. This can be seen as the setting the phase of the bars or as a "delay" before the bars are generated. The ***width*** parameter sets the bar width, to sub-pixel precision, and the ***amplitude*** parameter sets bar amplitude (integer value).

Space Parameters set the width and amplitude of the spaces between the bars. The ***width*** parameter sets the space width, to sub-pixel precision, and the ***amplitude*** parameter sets space amplitude (integer value).

Sampling Parameters specify how the pixel value is sampled. The sampled values are rounded to integers for drawing.

The ***optical blur*** parameter simulates the effects of lens blur. You can imagine a real image of bars and spaces that is blurred by the optics before it is sampled by the pixels in the sensor. Because bars and spaces in a synthetic image, we simulate the sampled intensity by integrating intensity in the synthetic image using a Gaussian multiplier.

The ***sampling method*** parameter sets how samples are drawn from the synthetic "digital" space. "center point in pixel" samples the synthetic pixel at its center. "uniform pixel area" assumes that the response of the pixel area is the same at all points and integrates the intensity values within the pixel area to give the drawn sample value. "nonuinform pixel area" sets the response at the edge of a pixel to be less than the center, thus simulating the fall-off due to micro-lenses on the pixels or to non-uniform "fill factor". The non-uniform responses are integrated to give the drawn sample value.

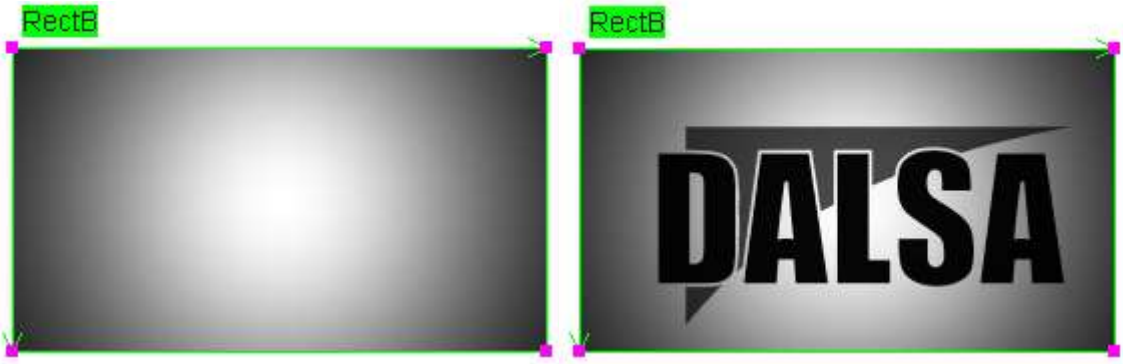
The ***post-sampling blur*** simulates low-pass filtering in the processing electronics of the sensor and camera and frame grabber. You can set the ***post-sampling blur factor*** to increase the blur (0 = no blur, 5 = maximum blur).

There are no outputs because this is a preprocessor.

Draw Gaussian [Preprocessor]

This preprocessor generates a Gaussian intensity distribution in the ROI, with an option to scale (multiply) the ROI's input image by the Gaussian distribution. The parameters are in three groups: general parameters, Location Parameters, and Shape Parametrers.

scale input image is the only general parameter. If true, the input ROI image is multiplied by the generated Gaussian. If false (default) the input ROI image is replaced by the Gaussian. Here is a Gaussian distribution when ***scale input image*** is true (on left) and false:



Location Parameters:

If ***automatic center*** is true, then the Gaussian peak is at the center of the ROI output image. If it is false, then the Gaussian peak location is specified by ***horiz. position*** and ***vert. position***. These positions are relative to the upper, left corner of the ROI.

Shape Parameters:

peak amplitude sets the peak amplitude of the Gaussian distribution. ***s.d. X*** and ***s.d. Y*** set the standard deviation of the Gaussian in the X (horizontal) and Y (vertical) directions, respectively. ***invert*** makes the peak of the Gaussian the darkest point, with intensity increasing away from the peak. Here is an inverted Gaussian, with a center location of ***horiz. position*** = 0, ***vert. position*** = 150.

This is a Preprocessor so there are no outputs.