IDT technical Note: **0007 (2013/04/24)**

“Image Quality Improvement in the SDK”

Image quality improvement is achieved with the configuration of some of the camera parameters. A list of those parameters is shown below:

CFA (Color Filter Array) interpolation

The parameters XSP_CI_MODE (color interpolation mode) and XSP_CI_THR (color interpolation threshold) control how the Bayer data is converted into the RGB space. If the mode is set to XS_CIM_BILINEAR the threshold is ignored. If the mode is set to XS_CIM_ADVANCED the threshold controls the sharpness of the conversion (a value of 0 corresponds to a very sharp image with possible noise known as "worm" effect, while a value of 255 corresponds to a softer image similar to the bilinear algorithm.

Optimal values: XSP_CI_MODE = XS_CIM_ADVANCED, XSP_CI_THR = 64.

Sharpening

The parameter **XSP_SHARPEN** (sharpening value) controls the overall strength of the sharpening effect and the parameter **XSP_SHARPEN_THR** (sharpening threshold) controls the minimum brightness change that will be sharpened. This can be used to sharpen more pronounced edges, while leaving more subtle edges untouched. It's especially useful to avoid sharpening noise.

Optimal values: XSP_SHARPEN = 2 XSP_SHARPEN_THR = 25

TNR (Temporal Noise Reduction)

The parameter **XSP_DYNAMIC_NR** controls the time-dependent noise reduction filter. Each pixel value is compared with the same pixel value in images acquired before and after and the result is used to eliminate the component of noise that is not a fixed pattern. The parameter is not supported on all cameras (see the XSI_TNR_SUPPORT) The value of this parameter should be set to 12 and never changed.

Optimal value: XSP_DYNAMIC_NR = 12

DNR (Dynamic Noise Reduction)

The parameter XSP_DYNAMIC_NR2 controls the space noise reduction filter. Each pixel is compared to a set of surrounding pixels in the same image and used to reduce noise. The result is a better uniformity in flat parts of the image. The parameter is not supported on all cameras (see the XSI_DNR2_SUPPORT) The value of this parameter should be set to 3 and never changed.

Optimal value: XSP_DYNAMIC_NR2 = 3

Gaussian (Blur) Filter

The parameter **XSP_GAUSS_FLT** controls the strength of the smoothing effect on the image. The effect is a reduction of image noise and a reduction of details due to the blurring.

Optimal value: XSP_GAUSS_FLT = 0