Variational Blue Noise Sampling – Appendix

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APPENDIX A
DENSITY FUNCTION DEFINITION FOR COLOR IMAGES

We assume that an input color image contains three color channels red (R), green (G), and blue (B) only. The intensity values of the red, green, and blue channels at pixel x are represented as $R_x, G_x,$ and B_x, respectively. We define $d_R(x)$, $d_G(x)$, $d_B(x)$, $d_C(x)$, $d_M(x)$, $d_Y(x)$, and $d_K(x)$ the densities for the 7 classes – Red, Green, Blue, Cyan, Magenta, Yellow and Black, respectively, as follows:

For classes Red, Green and Blue, we define

$$\begin{aligned} d_R(x) &= \max(R_x - S_x, 0), \\ d_G(x) &= \max(G_x - S_x, 0), \\ d_B(x) &= \max(B_x - S_x, 0), \end{aligned}$$

where S_x is the intensity value of the channel with the second largest intensity value at position x.

For classes Cyan, Magenta and Yellow, we define

$$\begin{aligned} d_C(x) &= \max(\min(G_x, B_x) - R_x, 0), \\ d_M(x) &= \max(\min(R_x, B_x) - G_x, 0), \\ d_Y(x) &= \max(\min(R_x, G_x) - B_x, 0), \end{aligned}$$

For the Black class, we define

$$d_K(x) = 255 - \max(R_x, G_x, B_x),$$

where 255 is the maximum intensity value.

APPENDIX B
VECTORIZED VERSION OF OUR COLOR STIPPLING RESULT.

Fig. 18 and Fig. 19 show the complete vectorized version of our color stippling result and [Wei 2010]'s color stippling result shown in Fig. 15 in the paper respectively.

Fig. 18. Vectorized version of our color stippling result by multi-class CapCVT.

Fig. 19. Vectorized version of [Wei 2010]'s color stippling result by multi-class dart throwing.