Computer Vision — Homework 10

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1 Laplace Mask 1

$$\text{Kernel} = \begin{matrix} 0 & 1 & 0 \\ 1 & -4 & 1 \\ 0 & 1 & 0 \end{matrix}, \text{ and Threshold} = 15$$

Figure 1: Laplace Mask 1

2 Laplace Mask 2

$$\text{Kernel} = \begin{matrix} \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{-8}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \end{matrix}, \text{ and Threshold} = 15$$

Figure 2: Laplace Mask 2

3 Minimum variance Laplacian

$$\text{Kernel} = \begin{matrix} \frac{2}{3} & \frac{-1}{3} & \frac{2}{3} \\ \frac{-1}{3} & \frac{-4}{3} & \frac{-1}{3} \\ \frac{2}{3} & \frac{-1}{3} & \frac{2}{3} \end{matrix}, \text{ and Threshold} = 20$$

Figure 3: Minimum variance Laplacian

4 Laplace of Gaussian

$$\text{Kernel} = \begin{matrix} 0 & 0 & 0 & -1 & -1 & -2 & -1 & -1 & 0 & 0 & 0 \\ 0 & 0 & -2 & -4 & -8 & -9 & -8 & -4 & -2 & 0 & 0 \\ 0 & -2 & -7 & -15 & -22 & -23 & -22 & -15 & -7 & -2 & 0 \\ -1 & -4 & -15 & -24 & -14 & -1 & -14 & -24 & -15 & -4 & -1 \\ -1 & -8 & -22 & -14 & 52 & 103 & 52 & -14 & -22 & -8 & -1 \\ -2 & -9 & -23 & -1 & 103 & 178 & 103 & -1 & -23 & -9 & -2 \\ -1 & -8 & -22 & -14 & 52 & 103 & 52 & -14 & -22 & -8 & -1 \\ -1 & -4 & -15 & -24 & -14 & -1 & -14 & -24 & -15 & -4 & -1 \\ 0 & -2 & -7 & -15 & -22 & -23 & -22 & -15 & -7 & -2 & 0 \\ 0 & 0 & -2 & -4 & -8 & -9 & -8 & -4 & -2 & 0 & 0 \\ 0 & 0 & 0 & -1 & -1 & -2 & -1 & -1 & 0 & 0 & 0 \end{matrix}$$, and Threshold = 3000

Figure 4: Laplace of Gaussian

5 Difference of Gaussian

$$\text{Kernel} = \begin{matrix} -1 & -3 & -4 & -6 & -7 & -8 & -7 & -6 & -4 & -3 & -1 \\ -3 & -5 & -8 & -11 & -13 & -13 & -13 & -11 & -8 & -5 & -3 \\ -4 & -8 & -12 & -16 & -17 & -17 & -17 & -16 & -12 & -8 & -4 \\ -6 & -11 & -16 & -16 & 0 & 15 & 0 & -16 & -16 & -11 & -6 \\ -7 & -13 & -17 & 0 & 85 & 160 & 85 & 0 & -17 & -13 & -7 \\ -8 & -13 & -17 & 15 & 160 & 283 & 160 & 15 & -17 & -13 & -8 \\ -7 & -13 & -17 & 0 & 85 & 160 & 85 & 0 & -17 & -13 & -7 \\ -6 & -11 & -16 & -16 & 0 & 15 & 0 & -16 & -16 & -11 & -6 \\ -4 & -8 & -12 & -16 & -17 & -17 & -17 & -16 & -12 & -8 & -4 \\ -3 & -5 & -8 & -11 & -13 & -13 & -13 & -11 & -8 & -5 & -3 \\ -1 & -3 & -4 & -6 & -7 & -8 & -7 & -6 & -4 & -3 & -1 \end{matrix}, \text{ and Threshold} = 1$$

Figure 5: Difference of Gaussian