Blatt 5 - Aufgabe 2

CMY -> HSI

$$CMY = \begin{bmatrix}1\\1\\1\end{bmatrix} - \begin{bmatrix}R\\G\\B\end{bmatrix}$$

$$\Rightarrow \begin{bmatrix}R\\G\\B\end{bmatrix} = \begin{bmatrix}1\\1\\1\end{bmatrix} - \begin{bmatrix}C\\M\\Y\end{bmatrix}$$

$$\Rightarrow I = \frac{1}{3}(R + G + B)$$

$$S = 1 - \frac{3}{(R+G+B)}\left[\min(R,G,B)\right]$$

$$H = \begin{cases} \theta & \text{if } B \leq G \\ 360 - \theta & \text{if } B > G \end{cases}$$

$$\theta \cos^{-1}\left(\frac{\frac{1}{2}\left((R+G)+R-B\right)}{\left((R-G)^2 + (R-B)\cdot(G-B)\right)^{1/2}}\right)$$

HSI → CMY

RG Sektor ($0° \leq H \leq 120°$)

$$B = I(1 - S)$$

$$R = I\left(1 + \frac{S\cos(H)}{\cos(60 - H)}\right)$$

$$G = 3I - (R + B)$$

GB Sektor ($120° \leq H \leq 240°$)

$$R = I(1 - S)$$

$$G = I\left(1 + \frac{S\cos(H)}{\cos(60 - H)}\right)$$

$$B = 3I - (R + B)$$

BR Sektor $240° \leq H \leq 360°$

$$G = I(1 - S)$$

$$B = I\left(1 + \frac{S\cos(H)}{\cos(60 - H)}\right)$$

$$R = 3I - (R + B)$$

$$\Rightarrow \begin{bmatrix} R \\ G \\ B \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} - \begin{bmatrix} C \\ M \\ Y \end{bmatrix}$$