

2PG-3

achromatische svetlo
 chromatische svetlo

$$U_{g1} = \left(\frac{1}{I_0} \right)^{1/255}$$

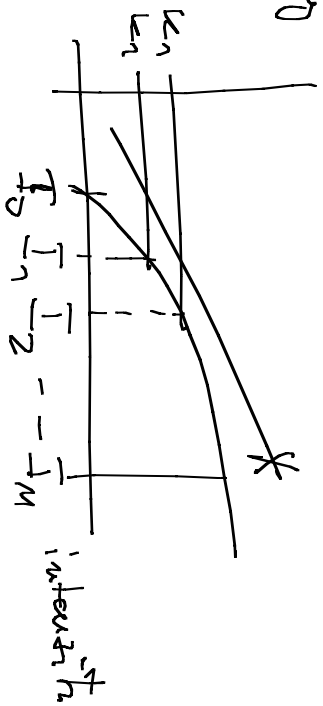
$$(255-j)255$$

$$I_j = I_0$$

$$I = c U_{g1}^d$$

\Rightarrow 8 korekce

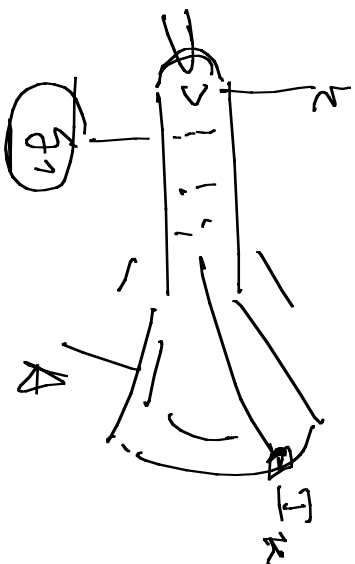
Vzravný
 pás



$$I_1 = r \cdot I_0$$

$$I_k = r \cdot I_{k-1}$$

$$I_k = r^k I_0$$



Polhození — poshození $P(x,y) > k \xrightarrow{r} \text{bíle}$, $\xrightarrow{d} \text{černa}$

Metoda vzorů



↳ zvětšit obraz v pixelech

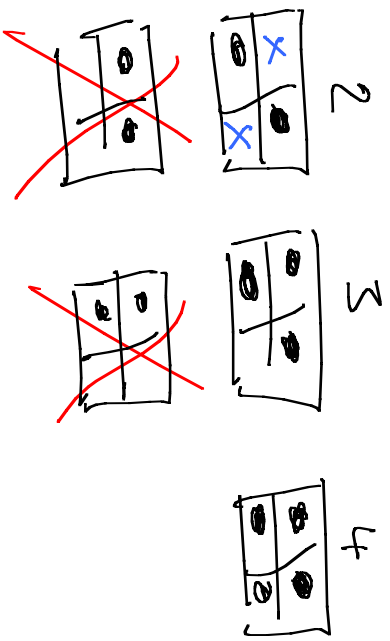
$$(3) T = \begin{bmatrix} 7 & 9 & 5 \\ 2 & 1 & 4 \\ 6 & 3 & 8 \end{bmatrix}$$

$$P(x,y) = 6$$

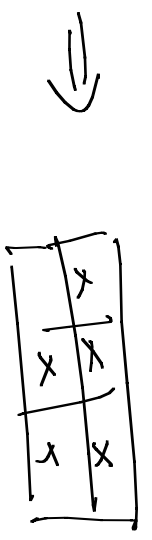
aktivní \Rightarrow

5

$$(2) T = \begin{bmatrix} 3 & 1 \\ 2 & 4 \end{bmatrix}$$



$$(3,2) = \begin{bmatrix} 4 & 1 & 5 \\ 6 & 3 & 2 \end{bmatrix}$$



Magie! Jaká velikost T ?

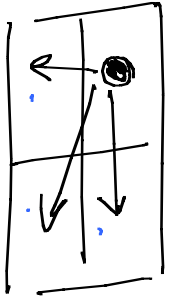
Prüfung

for y ↓

for x →
if $I(x,y) > T$ then
else

Black
White

Floyd-Steinberg



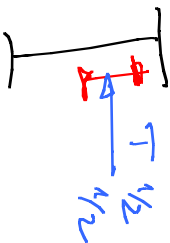
rozmyvanie

$$\text{prah } T = \frac{\text{max} - \text{min}}{2} + \text{min}$$

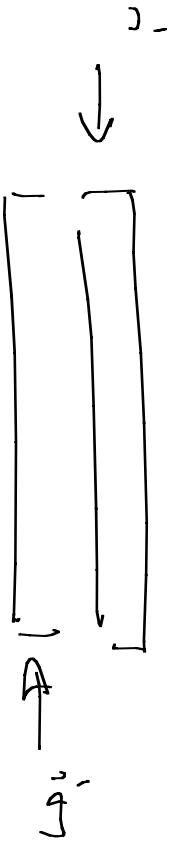
$$\frac{3}{8} \downarrow \searrow \frac{1}{4}$$

$$\text{difer } E = I(x,y) - \text{vyfistruvanie } (B/W)$$

$$\frac{3}{8} + \frac{3}{8} + \frac{1}{4} = \frac{8}{8} = 1$$



White
Black



for $x := z$
 for $x := z \rightarrow$

first $I(x, y) := \sum = I(x, y) - \varphi$

$I(x+1, y) := I(x+1, y) + \sum x \cdot 3/8$

$I(x, y+1) + i := \sum x \cdot 3/8 ; I(x+1, y+1) + i := \sum x \cdot 1/4 ;$

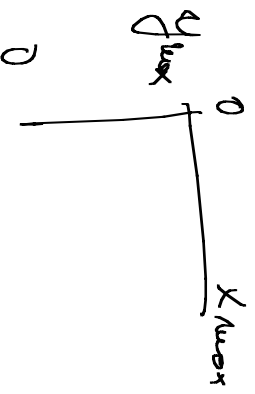
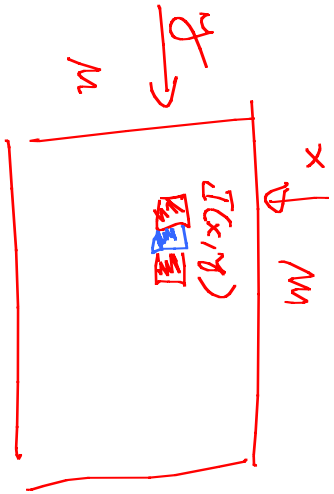


Differenz

- Wert der Variable ! neuerer Wert überbrückt.
- keine neue generierte Variable



$i = x$ mod M
 $i = y$ mod M



for $j := y_{\max}$ do do do do

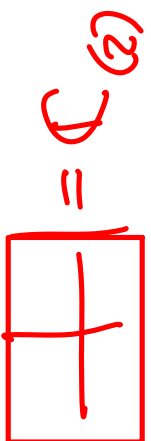
$i := y_{\min}$,

for $x := x_{\min}$ do do do do

$j := x_{\max}$

if $D[i, j] < I(x, y)$

then Put Pixel (x, y) as white
else Put Pixel (x, y) as black



generation 1830M

(1) $D = ?$, (1) $U = [1]$



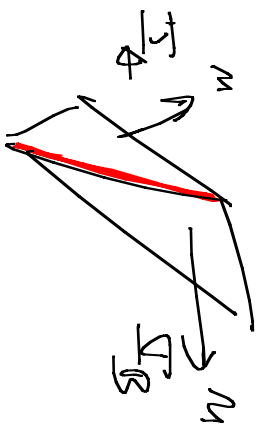
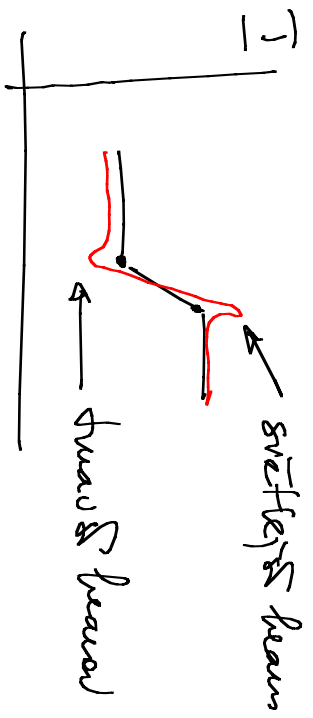
$$D^{(2)} = \begin{bmatrix} 4^{(2)} & 4^{(2)} \\ 4^{(2)} & 4^{(2)} \end{bmatrix} + \begin{bmatrix} 2^{(2)} & 2^{(2)} \\ 2^{(2)} & 2^{(2)} \end{bmatrix} U$$

2x vector vector (2x2)

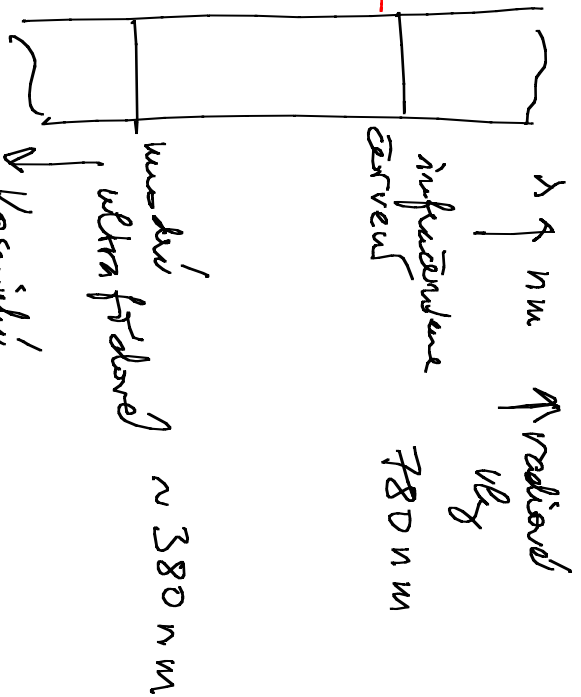
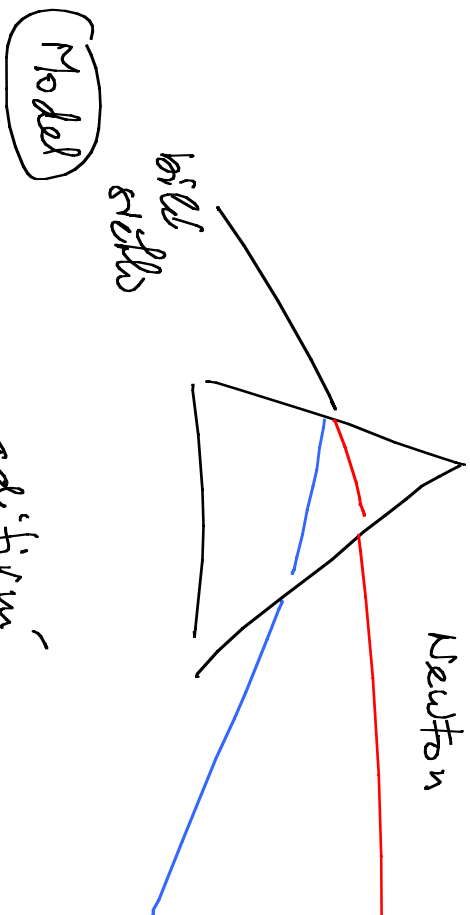
$$D^{(2)} = \begin{bmatrix} 0 & 2 \\ 3 & 1 \end{bmatrix}$$

$$U = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$$

Machungseffekt

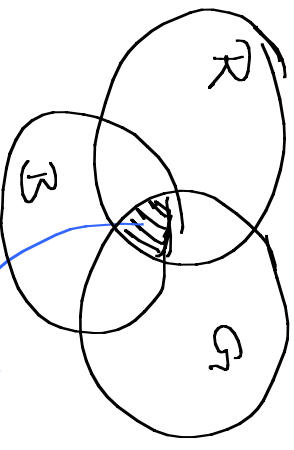
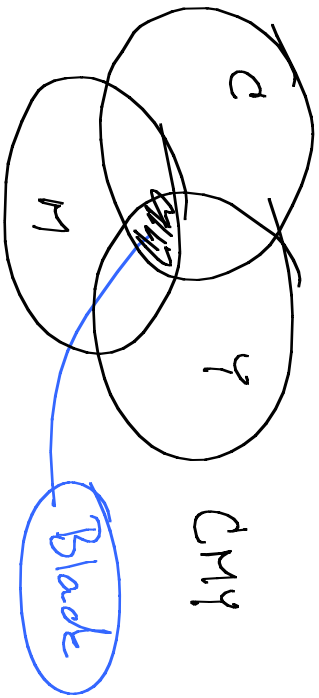


Chromatikal' svetla



Model
Svetlo

additivnaya (sozdaniye)
subtraktivnaya (rozniyeniye)



- R -- red -- červená
- G -- green -- zelená
- B -- blue -- modrá
- RGB
- C -- Cyan -- purpur
- M -- Magenta -- magenta
- Y -- yellow -- žlutá
- CMY
- White
- Black

Vlnové délky

R - 780 nm, G - 546,1 nm, B - 435,8 nm

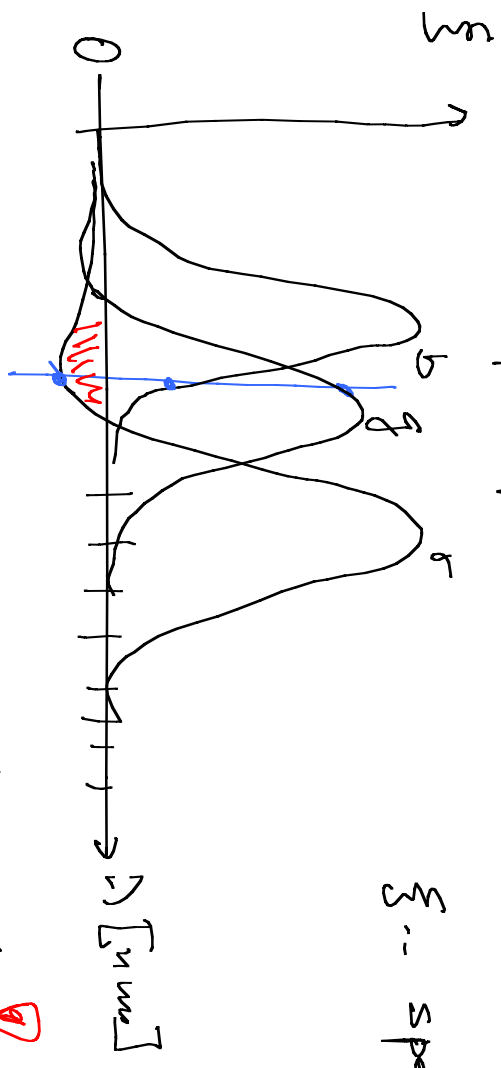
CIE
MKB



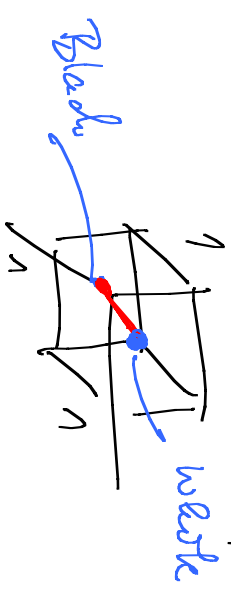
$$rR + gG + bB = C\lambda$$

$$[r, g, b]^T = C\lambda$$

Σ... spektrální
trojbarvé
základní

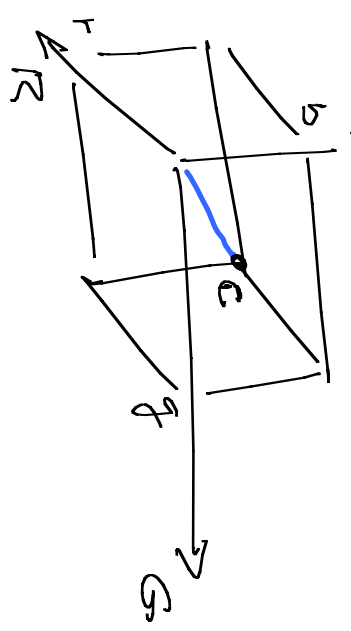


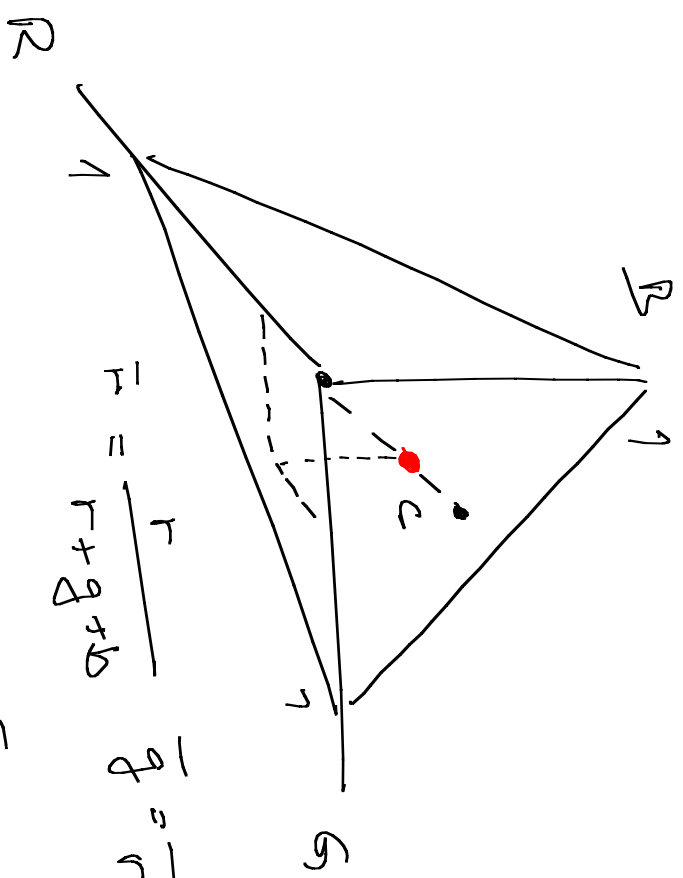
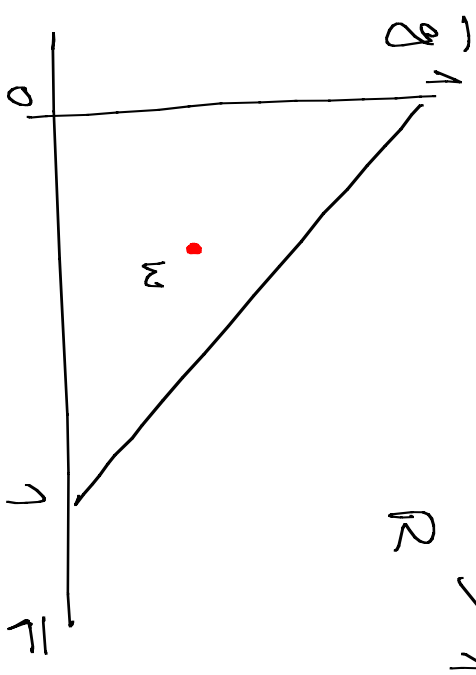
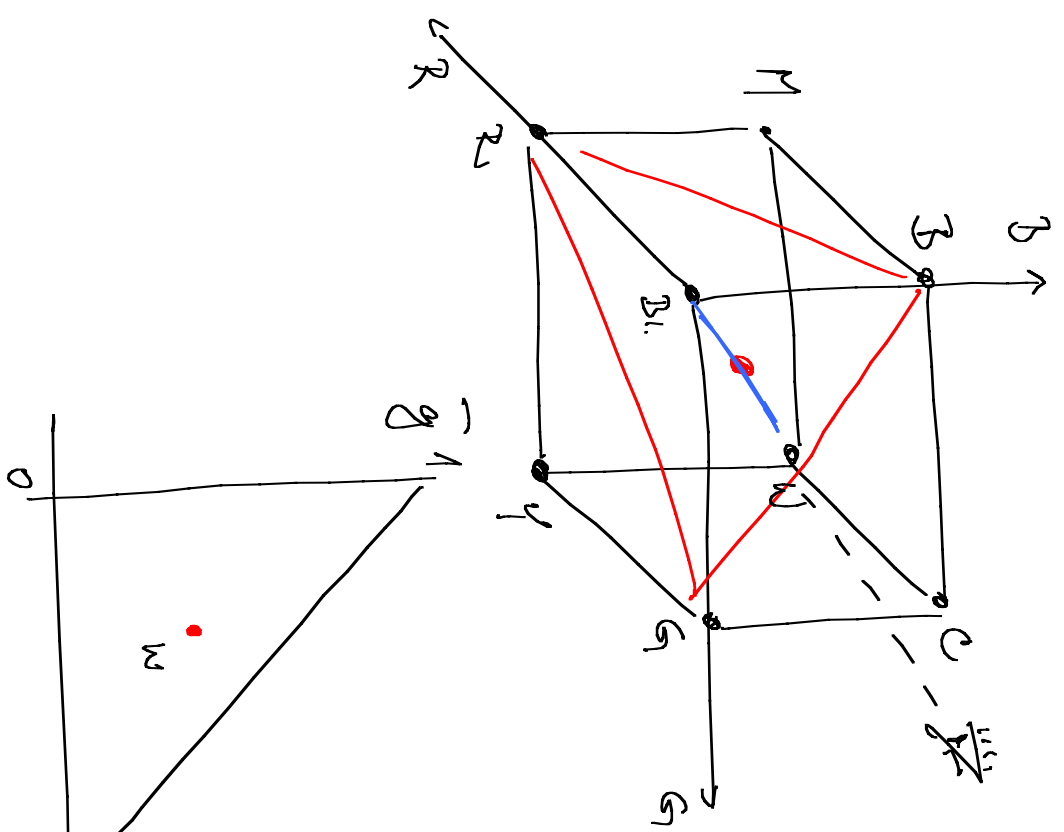
D R G B nepostavuje fyzikální základnu!



$$gG + bB = C\lambda = rR$$

$$B \quad r, g, b \in (0, 1)$$



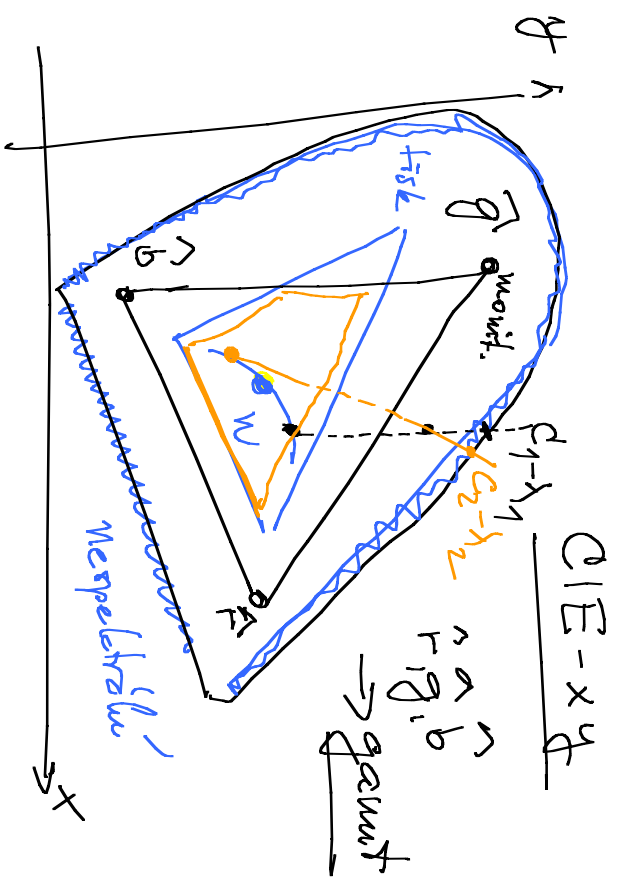
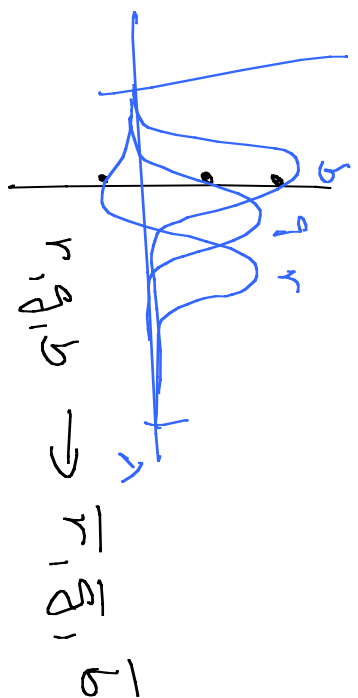
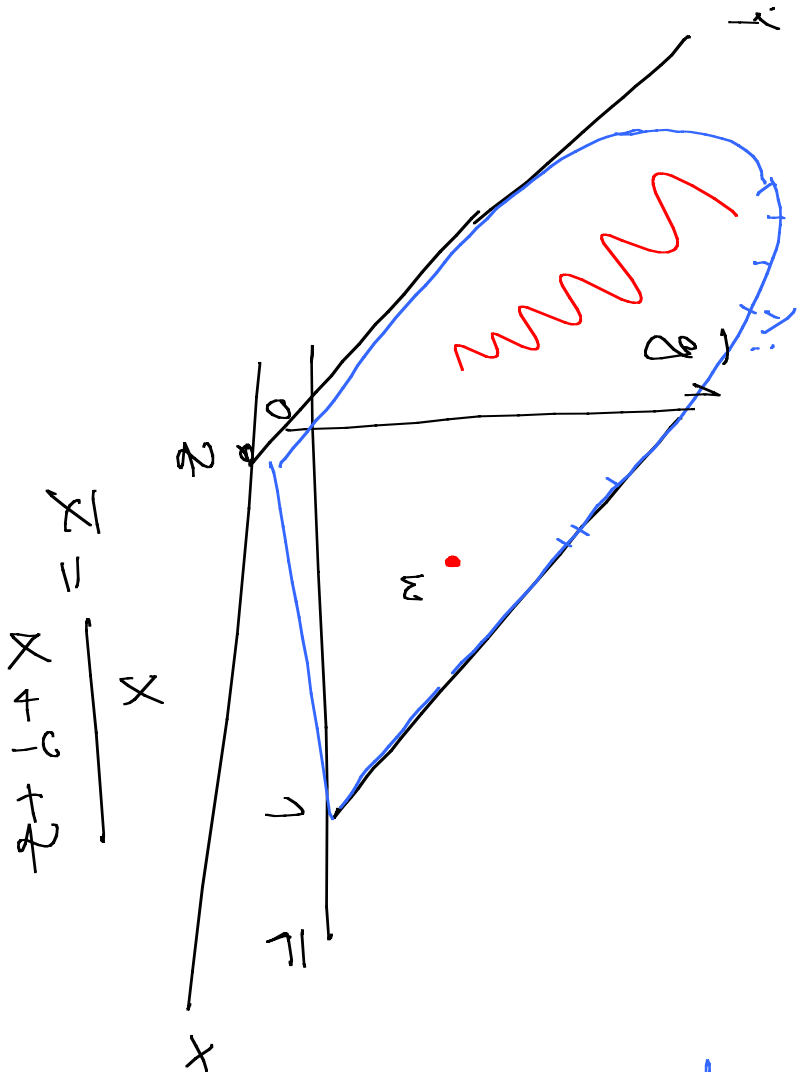


$$r = \frac{r}{r+b+d}$$

$$b = \frac{b}{r+b+d}$$

$$d = \frac{d}{r+b+d}$$

$$r+b+d = 1$$



$CMYK$

$$[r, g, b] = [1, 1, 1] - [c, m, y]$$

K

$$\xi = M \cdot \alpha$$

\bar{Y}
 \bar{I}
 \bar{Q}

I orange - kodakolend
 Q zelena - purpurava

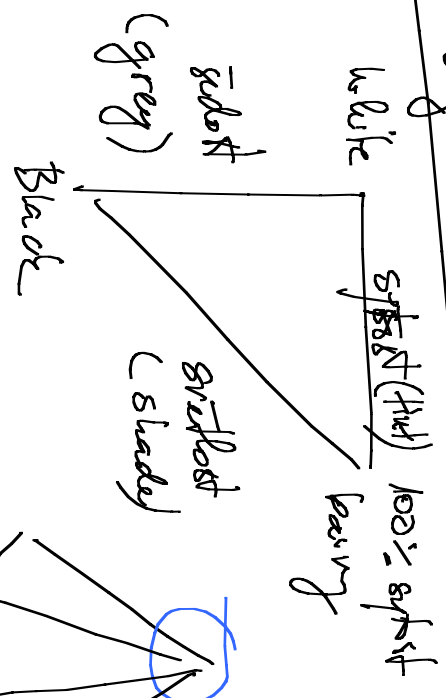
$Y \sim 477Hz$
 $I \sim 477Hz$
 $Q \sim 0.677Hz$

\bar{I}
 \bar{Q}

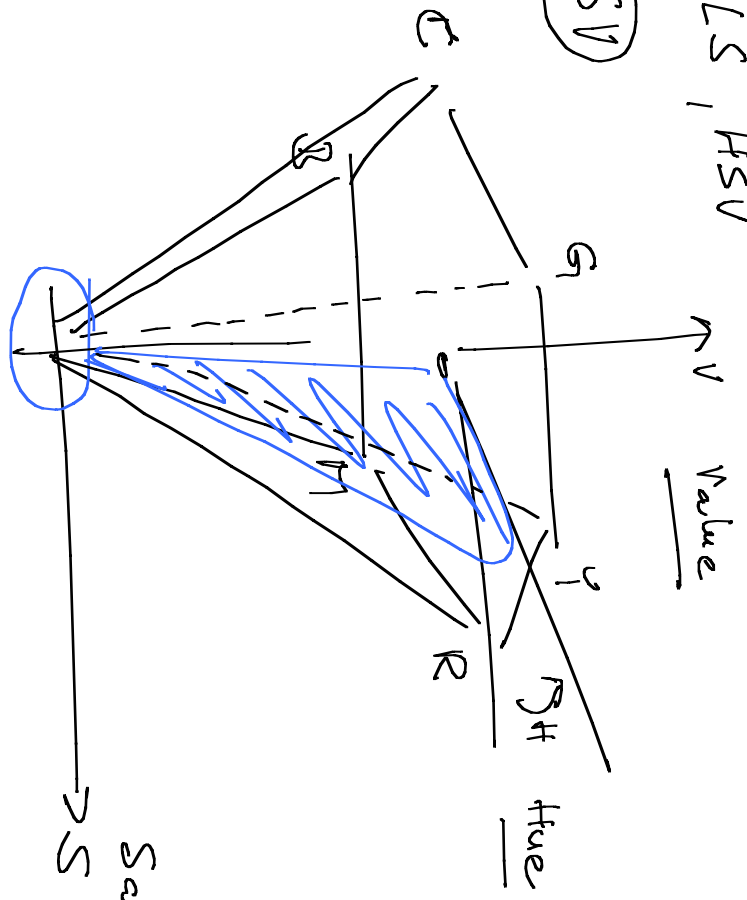
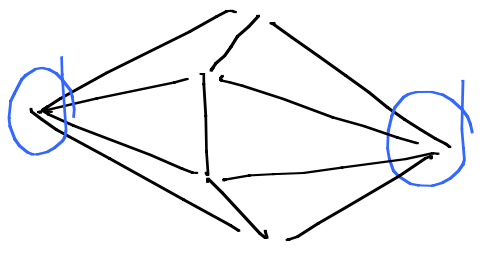
Upravljanje strukturnim sistemom

HLS, HSV

HSV



RGB \rightarrow HSV/HLS

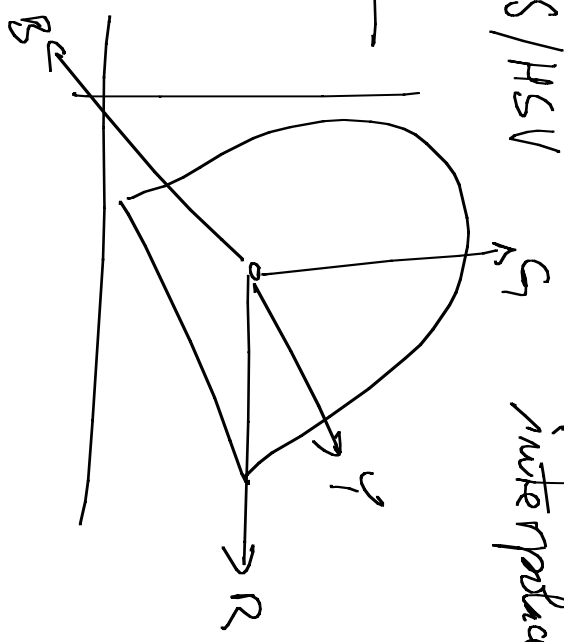


Saturation $\rightarrow S$

RGB - interpolate ~ spots / blades!

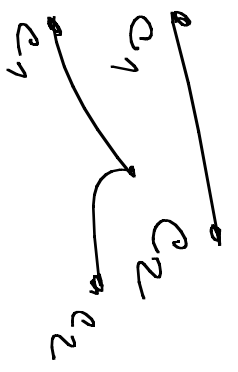
HLS/HSV interpolate mean blades!

RGB

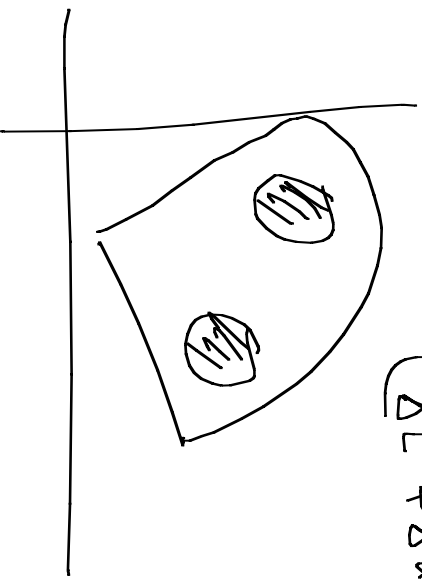


Luv Lab

$$L = (3)^{1/3}$$

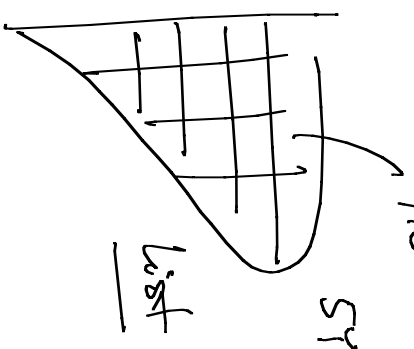


$$(\Delta L^2 + \Delta u^2 + \Delta v^2)^{1/2}$$



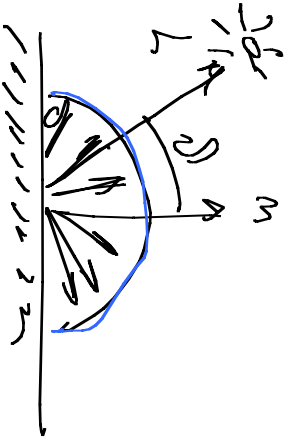
Katzlog

Munsell Katzlog

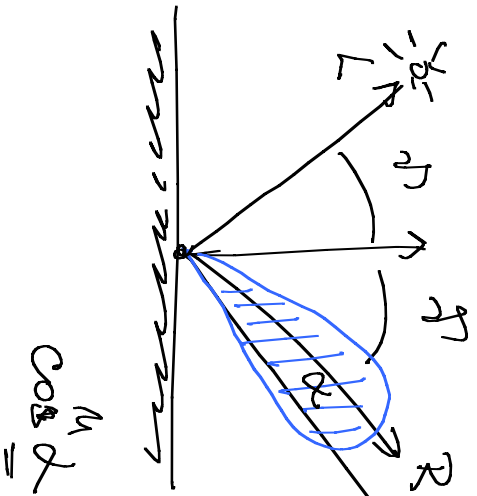


Direktori a sfirnovani

Difuzni stari



Zrpadljivi stari



$$\cos \alpha = \frac{L}{R}$$

