



Računarska grafika

predavanja
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12. Modeli boja

- Konverzija modela boja:
 - CMY → RGB
 - CMY → CMYK
 - CMYK → CMY
- RGB → YUV
- YUV → RGB
- RGB → YIQ
- YIQ → RGB
- RGB → HSL
- RGB → CMY



Konverzija modela boja

- RGB → YUV
- $Y = 0,299 \cdot R + 0,587 \cdot G + 0,114 \cdot B$
- $U = R - Y$
- $V = B - Y$

Y	=	0.299	0.587	0.114	·	R					
U	=	-0.147	-0.289	0.436	·	G					
V	=	0.615	-0.515	-0.100	·	B					

RGB to YUV color conversion for analog TV

Konverzija modela boja

- YUV → RGB
- $R = Y + 1,14 \cdot V$
- $G = Y - 0,395 \cdot U - 0,581 \cdot V$
- $B = Y + 2,032 \cdot U$

R	=	1.000	0.000	1.140	·	Y					
G	=	1.000	-0.395	-0.581	·	U					
B	=	1.000	2.032	0.000	·	V					

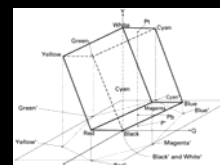
YUV to RGB color conversion for analog TV

Konverzija modela boja

- RGB → YIQ
- $Y = 0,299 \cdot R + 0,587 \cdot G + 0,114 \cdot B$
- $I = V \cos 33^\circ - U \sin 33^\circ$
 $I = 0,596 \cdot R - 0,275 \cdot G - 0,321 \cdot B$
- $Q = V \sin 33^\circ - U \cos 33^\circ$
 $Q = 0,212 \cdot R - 0,523 \cdot G + 0,311 \cdot B$

Konverzija modela boja

- YIQ → RGB
- $R = Y + 0,956 \cdot I + 0,621 \cdot Q$
- $G = Y - 0,272 \cdot I - 0,647 \cdot Q$
- $B = Y - 1,107 \cdot I + 1,704 \cdot Q$



Konverzija modela boja

- RGB → HSL

$$H = \cos^{-1} \left[\frac{(R-G) + (R-B)}{2\sqrt{(R-G)^2 + (R-B)(G-B)}} \right]$$

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

$$L = 0,299 \cdot R + 0,587 \cdot G + 0,114 \cdot B$$

Konverzija modela boja

- RGB → CMY

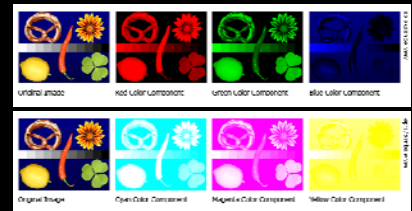
$$C = 1 - R$$

$$M = 1 - G$$

$$Y = 1 - B$$

$$R, G, B = 0 \dots 1$$

$$C, M, Y = 0 \dots 1$$



Konverzija modela boja

- RGB → CMY

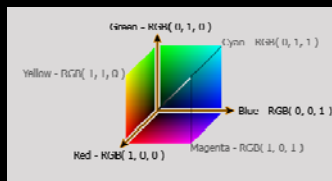
$$C = 1 - (R/255)$$

$$M = 1 - (G/255)$$

$$Y = 1 - (B/255)$$

$$R, G, B = 0 \dots 255$$

$$C, M, Y = 0 \dots 1$$



Konverzija modela boja

- CMY → RGB

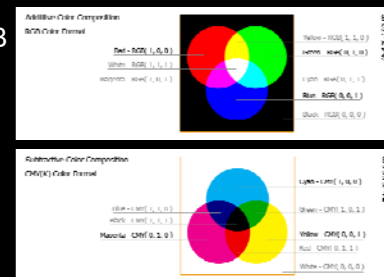
$$R = 1 - C$$

$$G = 1 - M$$

$$B = 1 - Y$$

$$R, G, B = 0 \dots 1$$

$$C, M, Y = 0 \dots 1$$



Konverzija modela boja

- CMY → CMYK

$$K = \min(C_{CMY}, M_{CMY}, Y_{CMY})$$

$$C_{CMYK} = C_{CMY} - K$$

$$M_{CMYK} = M_{CMY} - K$$

$$Y_{CMYK} = Y_{CMY} - K$$

- $\min(x,y,z)$ – najmanja vrijednost od x,y,z



Konverzija modela boja

- CMYK → CMY

$$C_{CMY} = C_{CMYK} \cdot (1 - K) \cdot K$$

$$M_{CMY} = M_{CMYK} \cdot (1 - K) \cdot K$$

$$Y_{CMY} = Y_{CMYK} \cdot (1 - K) \cdot K$$

