Information

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Color Correction Methods: Polynomial

$$X = MP$$

X = Reference XYZ values
P = Camera RGB values
M = Correction matrix

$$X = \begin{pmatrix} X_1 & X_2 & X_3 & \dots & X_m \\ Y_1 & Y_2 & Y_3 & \dots & Y_m \\ Z_1 & Z_2 & Z_3 & \dots & Z_m \end{pmatrix}$$

$$P = \begin{pmatrix} R_1 & R_2 & R_3 & \dots & R_m \\ G_1 & G_2 & G_3 & \dots & G_m \\ B_1 & B_2 & B_3 & \dots & B_m \\ R_1^2 & R_2^2 & R_3^2 & \dots & R_m^2 \\ G_1^2 & G_2^2 & G_2^2 & \dots & G_m^2 \\ B_1^2 & B_2^2 & B_3^2 & \dots & B_m^2 \\ R_1G_1 & R_2G_2 & R_3G_3 & \dots & R_mG_m \\ R_1B_1 & R_2B_2 & R_3B_3 & \dots & R_mB_m \\ G_1B_1 & G_2B_2 & G_3B_3 & \dots & G_mB_m \end{pmatrix}$$

$$M = \begin{pmatrix} m_{11} & m_{12} & m_{13} & m_{14} & m_{15} & m_{16} & m_{17} & m_{18} & m_{19} \\ m_{21} & m_{22} & m_{23} & m_{24} & m_{25} & m_{26} & m_{27} & m_{28} & m_{29} \\ m_{31} & m_{32} & m_{33} & m_{34} & m_{35} & m_{36} & m_{37} & m_{38} & m_{39} \end{pmatrix}$$

If ColorChecker:
- Classic → m=24
- Digital SG → m=140

[2]G.Hong et al., "*A study of digital camera colorimetric characterisation based on polynomial modelling*", Color Research and Application (2001)

Color Correction Methods: Root Polyn.

$$X = MP$$

X = Reference XYZ values
P = Camera RGB values
M = Correction matrix

$$X = \begin{pmatrix} X_1 & X_2 & X_3 & \dots & X_m \\ Y_1 & Y_2 & Y_3 & \dots & Y_m \\ Z_1 & Z_2 & Z_3 & \dots & Z_m \end{pmatrix}$$

$$P = \begin{pmatrix} R_1 & R_2 & R_3 & \dots & R_m \\ G_1 & G_2 & G_3 & \dots & G_m \\ B_1 & B_2 & B_3 & \dots & B_m \\ \sqrt{R_1G_1} & \sqrt{R_2G_2} & \sqrt{R_3G_3} & \dots & \sqrt{R_mG_m} \\ \sqrt{R_1B_1} & \sqrt{R_2B_2} & \sqrt{R_3B_3} & \dots & \sqrt{R_mB_m} \\ \sqrt{G_1B_1} & \sqrt{G_2B_2} & \sqrt{G_3B_3} & \dots & \sqrt{G_mB_m} \end{pmatrix}$$

$$M = \begin{pmatrix} m_{11} & m_{12} & m_{13} & m_{14} & m_{15} & m_{16} \\ m_{21} & m_{22} & m_{23} & m_{24} & m_{25} & m_{26} \\ m_{31} & m_{32} & m_{33} & m_{34} & m_{35} & m_{36} \end{pmatrix}$$

If ColorChecker:
- Classic → m=24
- Digital SG → m=140

[3]G.D.Finlayson et al., "*Color Correction Using Root-Polynomial Regression*", IEEE Transactions on Image Processing (2015)

3-minute Presentation: Who does what?

	Presenter 1	Presenter 2	Presenter 3	Presenter 4
Understanding #TheDress	Thomas Goncalves	Alexandre Lamure	Baptiste Esteban	
Effects of Color Brightness	Robin Le Bihan	Alexandre Kirszenberg	Hadrien Delassus	
Skin Color Detection Techniques	Charles Ginane	Seungme Yi	Clément Fang	
Color Management with ICC Profiles	Florian Amsallem	Victor Collod	Younes Khoudli	Anis Ladram
Segmentation of Color Images by Clustering	Thomas De Carvalho	Daniel Godin	Marion Claus	
Life of a Color	Hugo Verjus	Ellena Davoine	Danae Marmai	
Changes in Surface Color of Chocolate	Thibault Guisnet	Antoine Sainson	Maria Souza Princi	
Clothes Matching for Blind	Timothée Barde	Leo Valais	Hugo Linsenmaier	