Gernot Hoffmann

Test for Optimal Gray Reproduction

Pixel synchronized PDF
Correct View
Calibrated monitor Gamma=2.2
Zoom = 200%

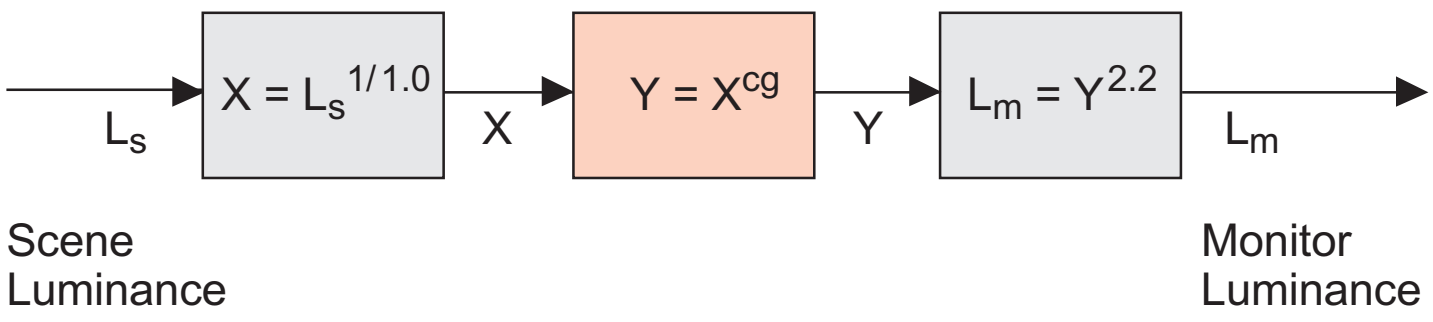
The Task

Find perceptually optimized corrections for a gray image

The Test

Technical digital photo, linear grayscale
By courtesy of
Dr.Klaus Andresen, Technische Universität Braunschweig

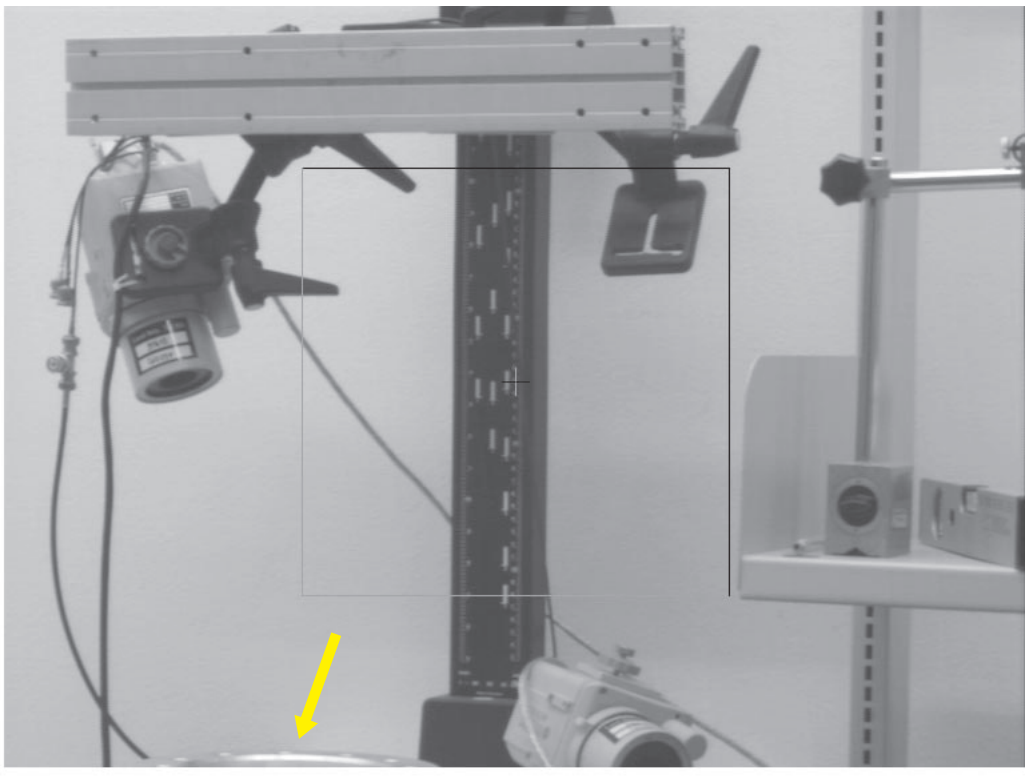
First block:	No correction applied by camera
Second block	Power function correction cg = 1.0 ... 0.7
Third block:	Gamma function by calibrated monitor

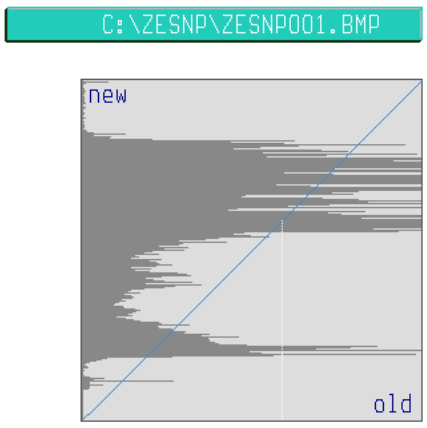


May 19, 2002
Website
Load browser and click here

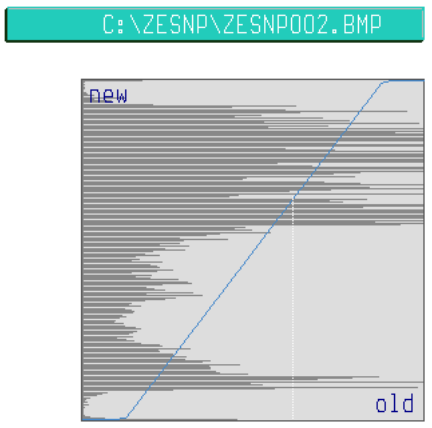
Original image, bad level adjustment
Dark 49
Light 207 , highlight is an exception

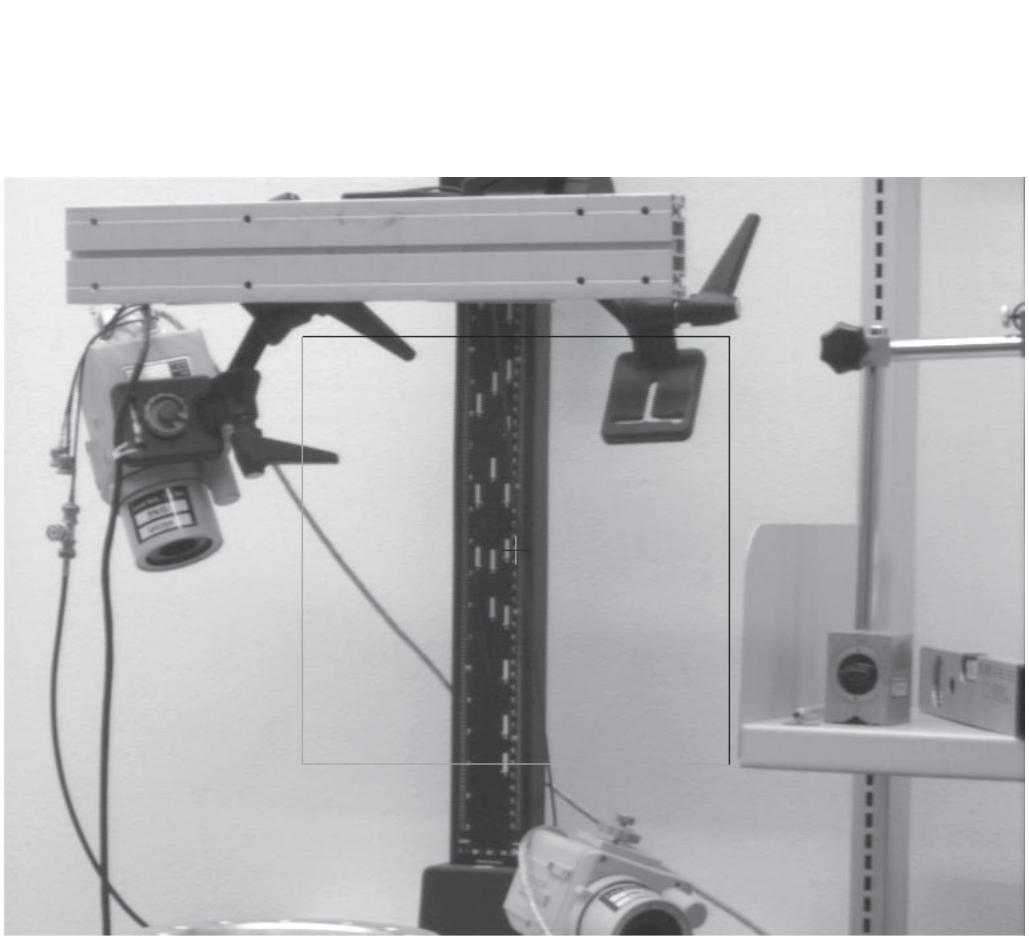
The histogram shows new values.
The new values are the old values



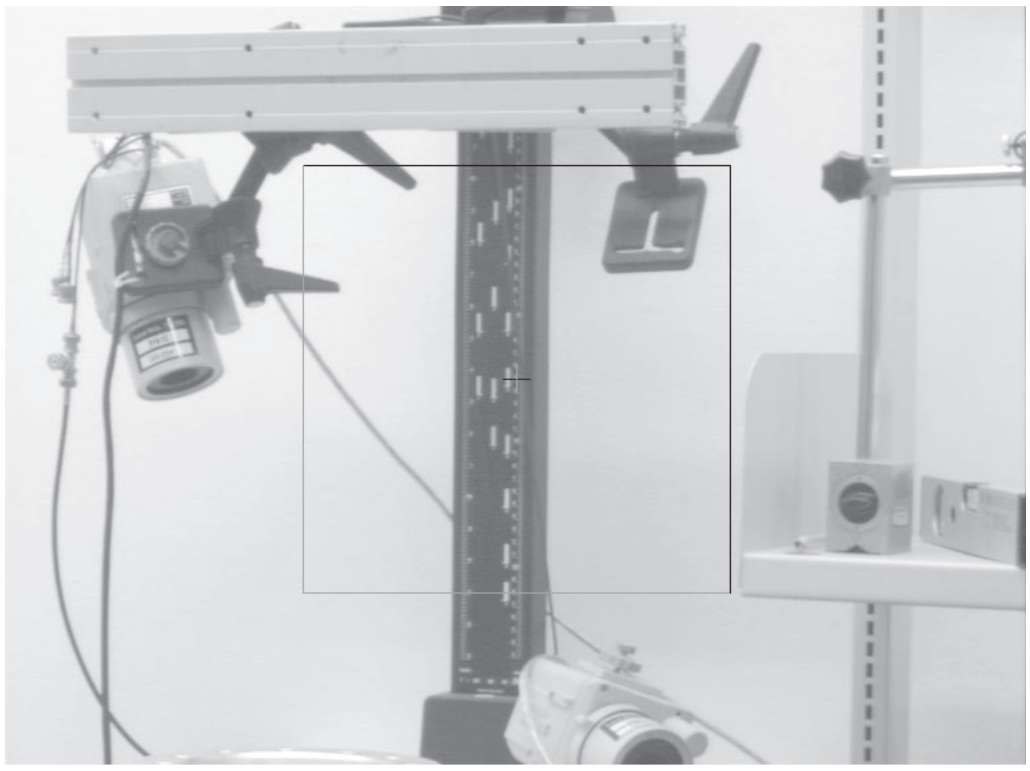


Level adjustment
Dark - 40
Light +40

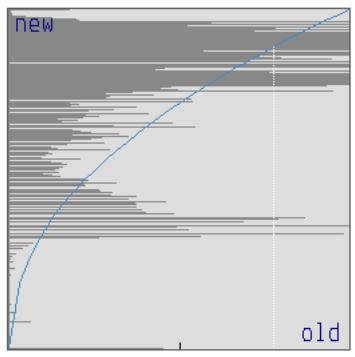




Inverse Gamma adjustment
cg = 1/2.2 = 0.45
Too light



C:\ZESNP\ZESNP003.BMP

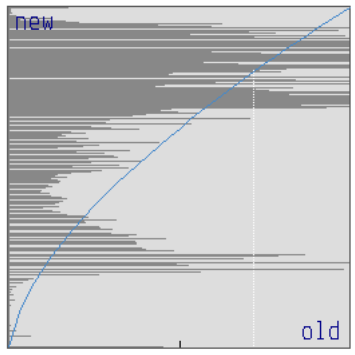


N,M Gamma = 0.46
-+ Shift Center = 128
ALT+S Store Profile
ALT+L Load Profile
ALT+P Previous Profile
C:\ZEBRA\Gray.Prf

Zebra128
E:\\ANDRE110.BMP BMP-32
RGB Nonlin: Pal=181
Q,A Red Grad 1.Ord 0
W,S Grn 0
E,D Blu 0
R,F Red Grad 2.Ord 0
T,G Grn 0
Z,H Blu 0
I,K RGB Grad 1.Ord ▫
O,L RGB Grad 2.Ord ▫
< Undo RGB Nonlin.
ENT Execute FullScreen
ESC Menue
X Shift Menue Area

Inverse Gamma adjustment
cg = 1/1.6 = 0.63
Reasonable

C:\ZESNP\ZESNP004.BMP

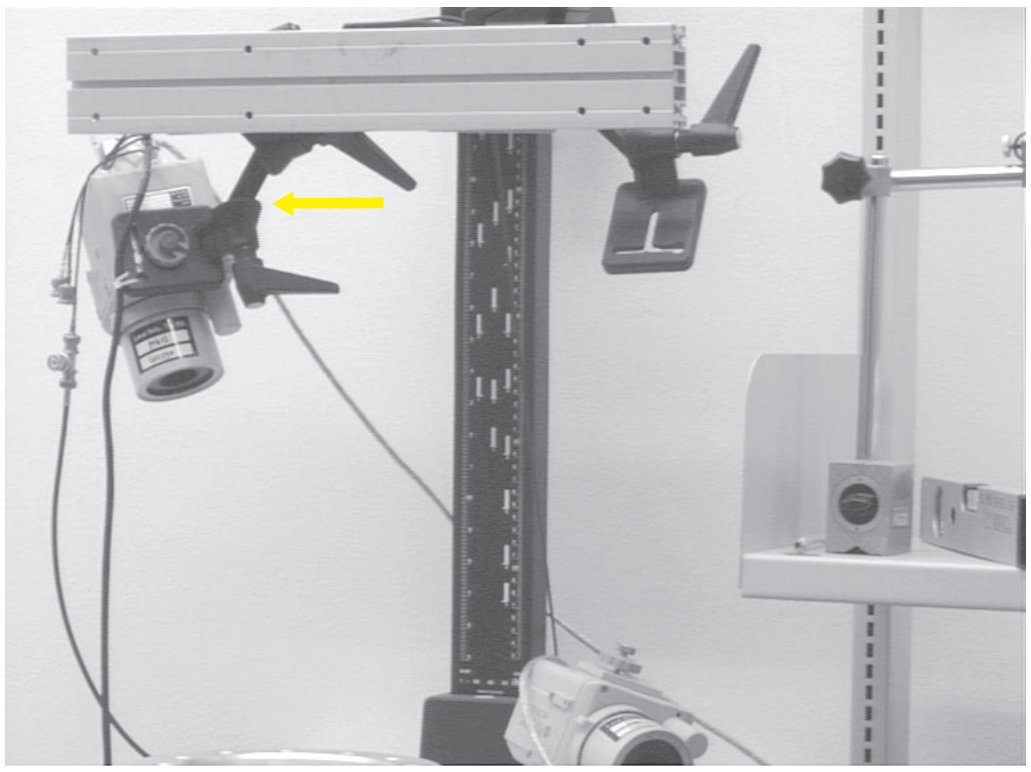


N,M Gamma = 0.63
-+ Shift Center = 128
ALT+S Store Profile
ALT+L Load Profile
ALT+P Previous Profile
C:\ZEBRA\Gray.Prf

Zebra128
E:\\ANDRE110.BMP BMP-32
RGB Nonlin: Pal=181
Q,A Red Grad 1.Ord 0
W,S Grn 0
E,D Blu 0
R,F Red Grad 2.Ord 0
T,G Grn 0
Z,H Blu 0
I,K RGB Grad 1.Ord ▫
O,L RGB Grad 2.Ord ▫
< Undo RGB Nonlin.
ENT Execute FullScreen
ESC Menue
X Shift Menue Area

Inverse Gamma adjustment
cg = 1/1.6 = 0.63
Additionally sharpening

Moderate inverse Gamma adjustment improves dark resolution. Would be better for a level adjusted source image.



C:\ZESNP\ZESNP005.BMP

Zebra128
E:\\ANDRE111.BMP BMP-8
Filter Hard Extra

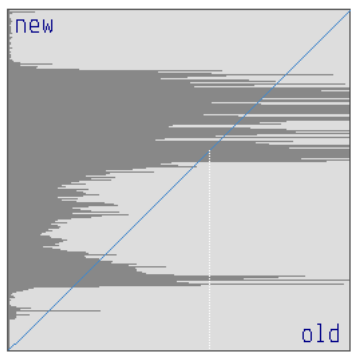
Δ Inc. Level = 2
∇ Dec. Level

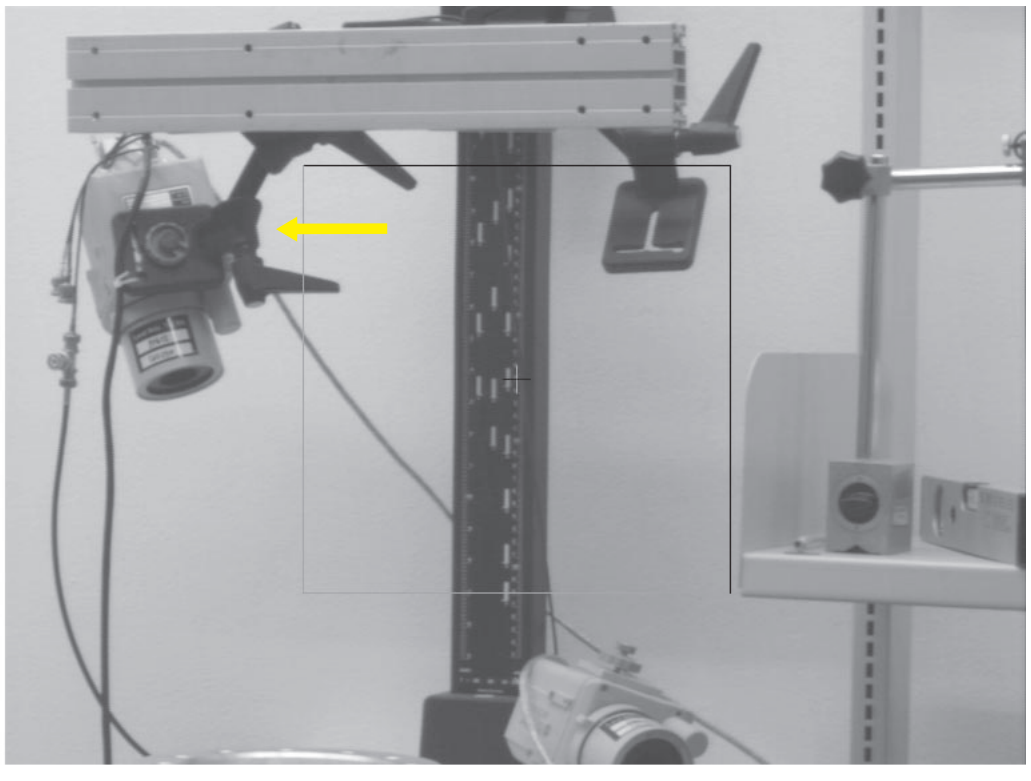
< Undo Filter

ESC Menue
X Shift Menue Area

Original image, once again

C:\ZESNP\ZESNP001.BMP



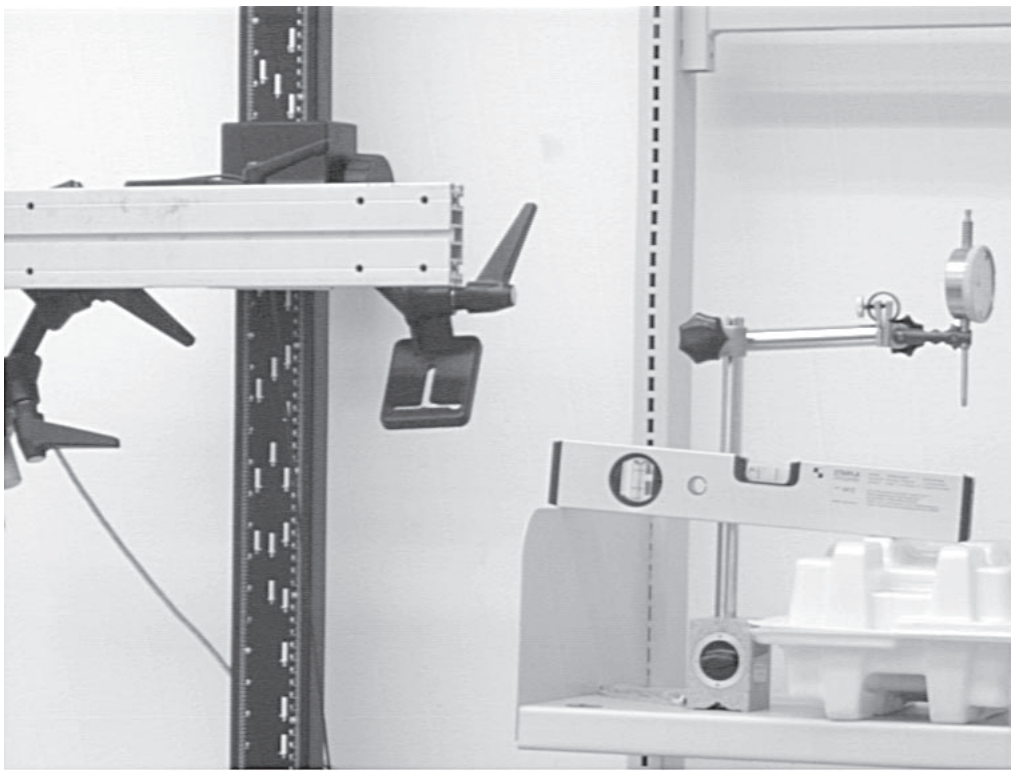


TAB Show Histogram
ALT+S Store Profile
ALT+L Load Profile
ALT+P Previous Profile
C:\ZEBRA\Gray.Prf

Zebra128
E:\\ANDRE110.BMP BMP-32
RGB Linear: Pal=181
Q,A Red Left 0
W,S Grn 0
E,D Blu 0
R,F Red Right 255
T,G Grn 255
Z,H Blu 255
I,K RGB Left ▫
O,L RGB Right ▫
∇ Reset Curves
ENT Execute FullScreen
ESC Menue
X Shift Menue Area

Another example

Dark level adjustment -60
Light level adjustment +45
Inverse Gamma adjustment
cg = 1/1.6 = 0.63
Additionally strong sharpening



Original image