

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

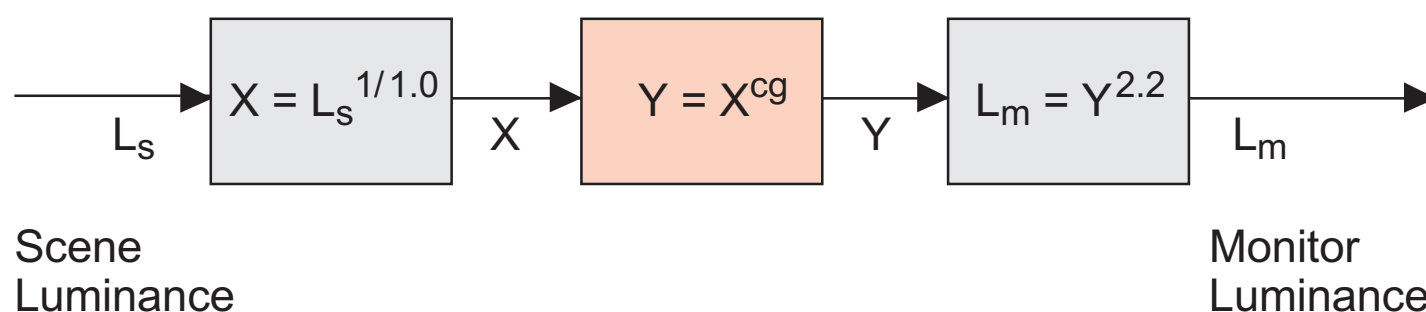
By courtesy of

Dr.Klaus Andresen, Technische Universität Braunschweig

First block: No correction applied by camera

Second block Power function correction $c_g = 1.0 \dots 0.7$

Third block: Gamma function by calibrated monitor



May 19, 2002

Website

Load browser and click here

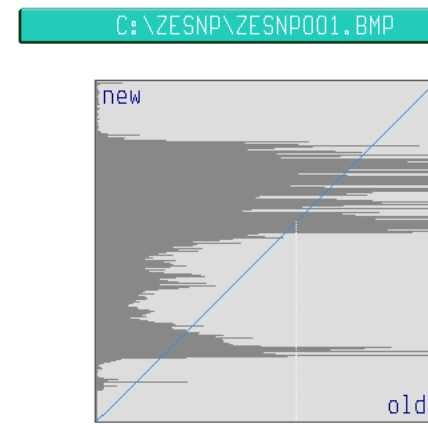
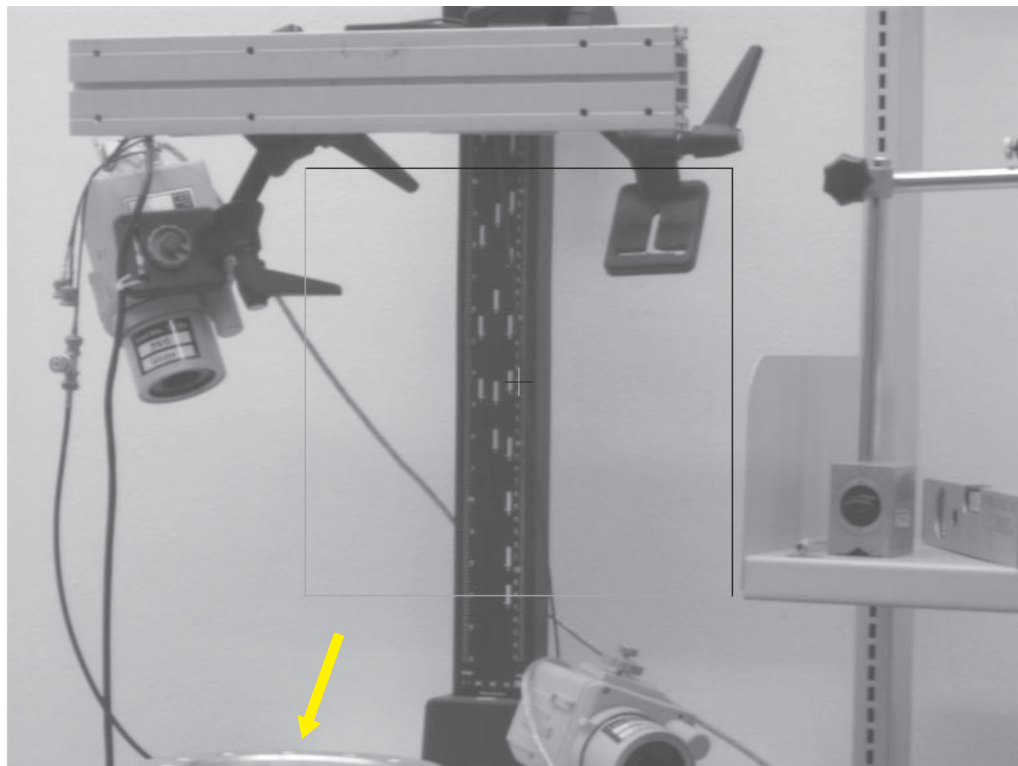
Original image, bad level adjustment

Dark 49

Light 207 , highlight is an exception

The histogram shows new values.

The new values are the old values

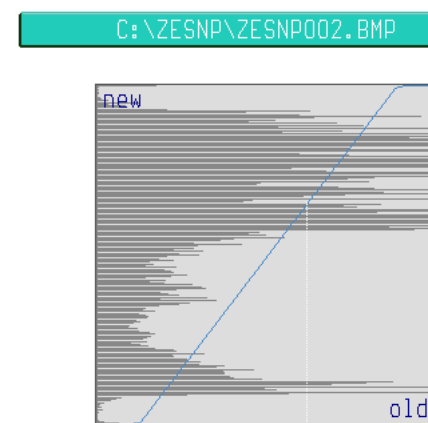
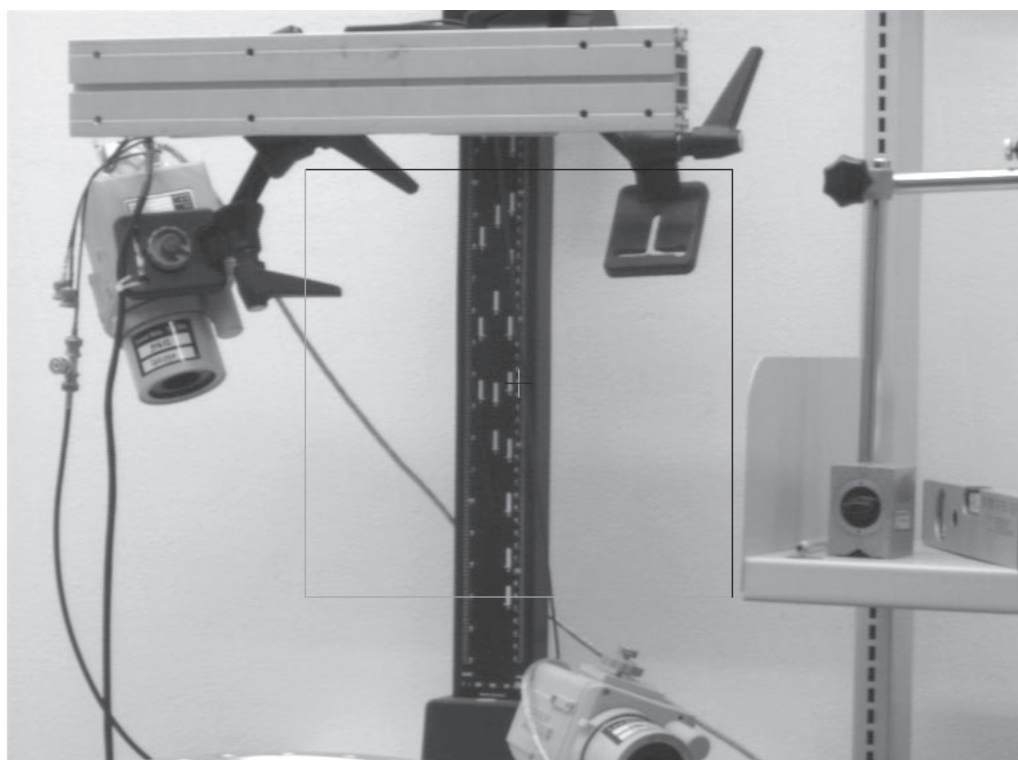


TAB	Show	Histogram
ALT+S	Store	Profile
ALT+L	Load	Profile
ALT+P	Previous Profile	
C:\ZEBRA\Gray.Pr f		
Zebra128		
E:\ANDRE110.BMP BMP-32		
RGB Linear: Pal=181		
Q,A	Red Left	0
W,S	Grn	0
E,D	Blu	0
R,F	Red Right	255
T,G	Grn	255
Z,H	Blu	255
I,K	RGB Left	□
O,L	RGB Right	□
V	Reset Curves	
ENT	Execute FullScreen	
ESC	Menue	
X	Shift Menue Area	

Level adjustment

Dark - 40

Light +40

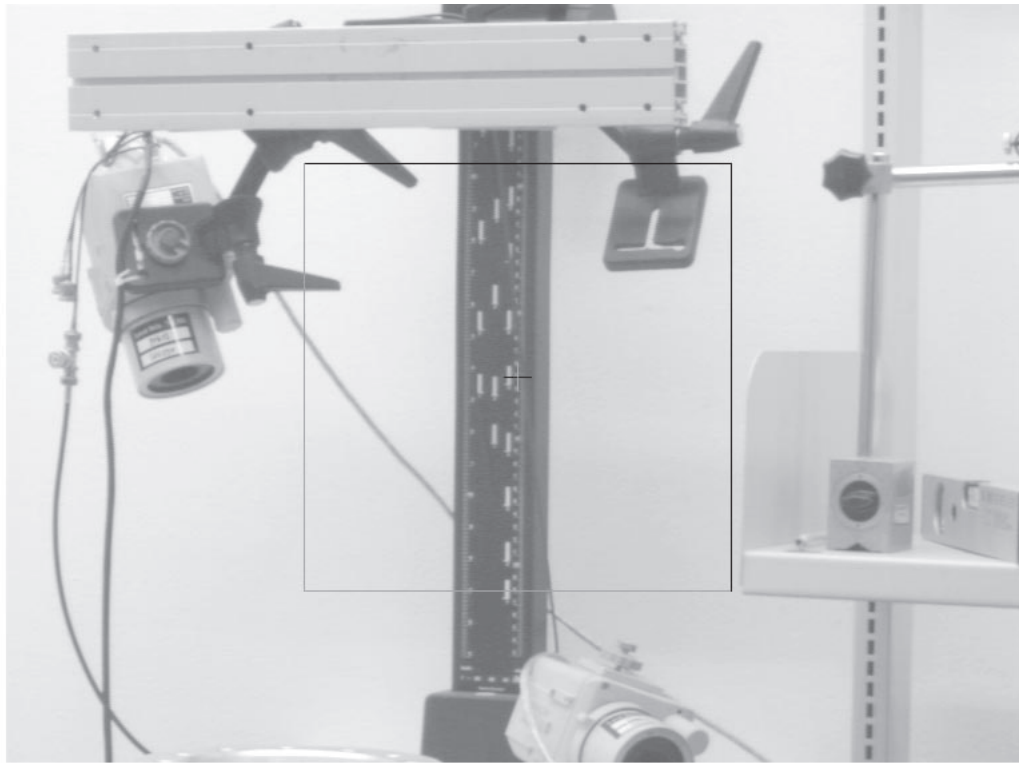


TAB	Show	Histogram
ALT+S	Store	Profile
ALT+L	Load	Profile
ALT+P	Previous Profile	
C:\ZEBRA\Gray.Pr f		
Zebra128		
E:\ANDRE110.BMP BMP-32		
RGB Linear: Pal=181		
Q,A	Red Left	-40
W,S	Grn	-40
E,D	Blu	-40
R,F	Red Right	295
T,G	Grn	295
Z,H	Blu	295
I,K	RGB Left	□
O,L	RGB Right	□
<	Undo RGB Linear	
ENT	Execute FullScreen	
ESC	Menue	
X	Shift Menue Area	

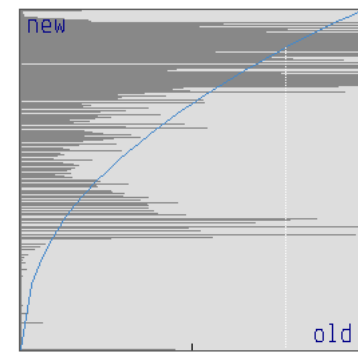
Inverse Gamma adjustment

$$cg = 1/2.2 = 0.45$$

Too light



C:\ZESNP\ZESNP003.BMP



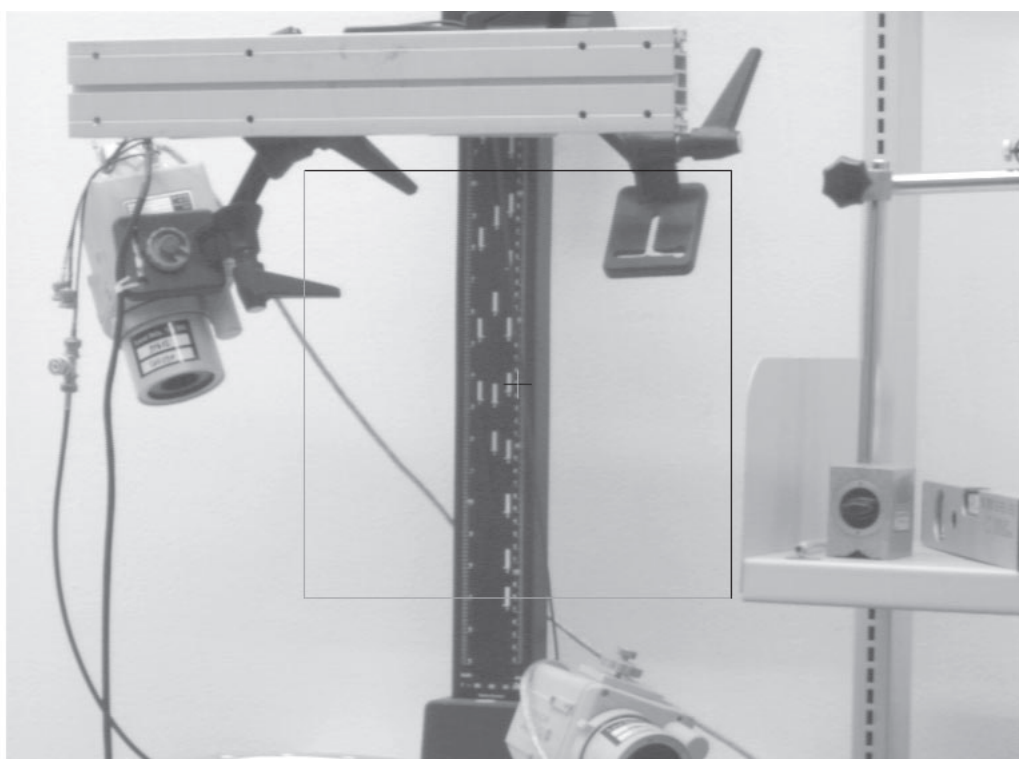
N,M Gamma = 0.46
 -+ Shift Center = 128
 ALT+S Store Profile
 ALT+L Load Profile
 ALT+P Previous Profile
 C:\ZEBRA\Gray.Pr f

Zebra128
 E:\ANDRE110.BMP BMP-32
 RGB Nonlin: Pal=181
 Q,A Red Grad 1.0rd 0
 W,S Grn 0
 E,D Blu 0
 R,F Red Grad 2.0rd 0
 T,G Grn 0
 Z,H Blu 0
 I,K RGB Grad 1.0rd □
 O,L RGB Grad 2.0rd □
 < Undo RGB Nonlin.
 ENT Execute FullScreen
 ESC Menue
 X Shift Menue Area

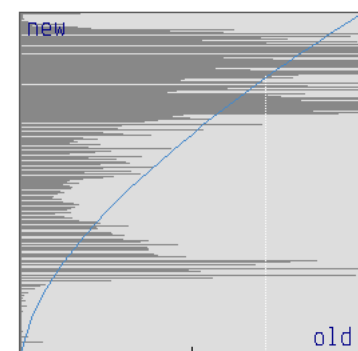
Inverse Gamma adjustment

$$cg = 1/1.6 = 0.63$$

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.Pr f

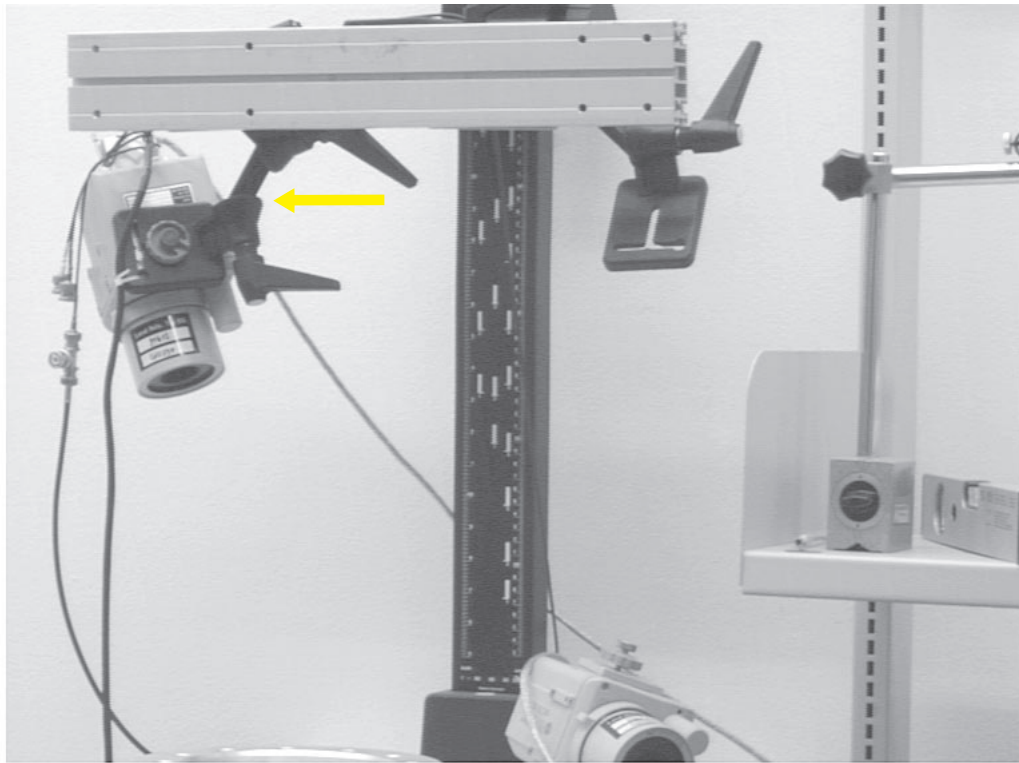
Zebra128
 E:\ANDRE110.BMP BMP-32
 RGB Nonlin: Pal=181
 Q,A Red Grad 1.0rd 0
 W,S Grn 0
 E,D Blu 0
 R,F Red Grad 2.0rd 0
 T,G Grn 0
 Z,H Blu 0
 I,K RGB Grad 1.0rd □
 O,L RGB Grad 2.0rd □
 < Undo RGB Nonlin.
 ENT Execute FullScreen
 ESC Menue
 X Shift Menue Area

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

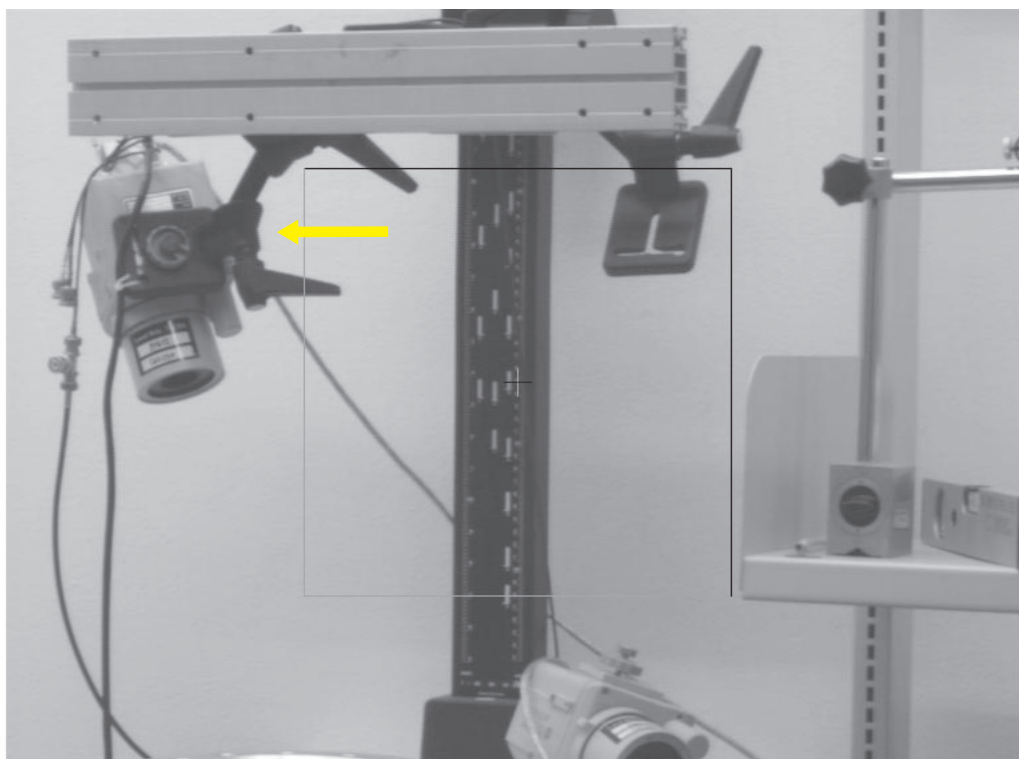
Zebra128
E:\ANDRE111.BMP BMP-8
Filter Hard Extra

Δ Inc. Level = 2
∇ Dec. Level

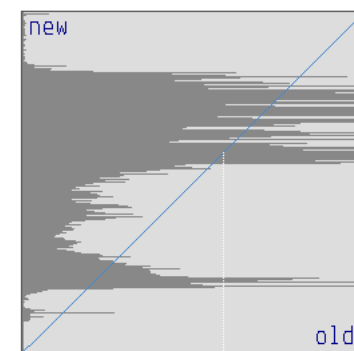
< Undo Filter

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.Pr f

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

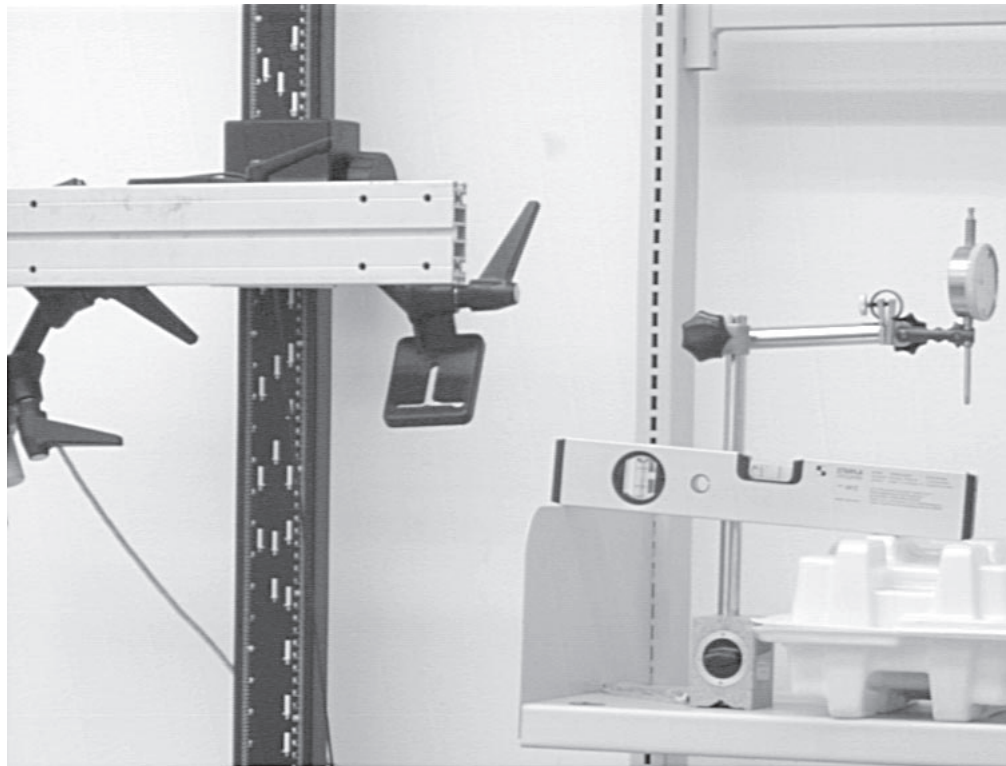
Dark level adjustment -60

Light level adjustment +45

Inverse Gamma adjustment

$$cg = 1/1.6 = 0.63$$

Additionally strong sharpening



Original image

