

Examples:

Example 1:

A. Inputs:

1. Image of the Color Checker Chart

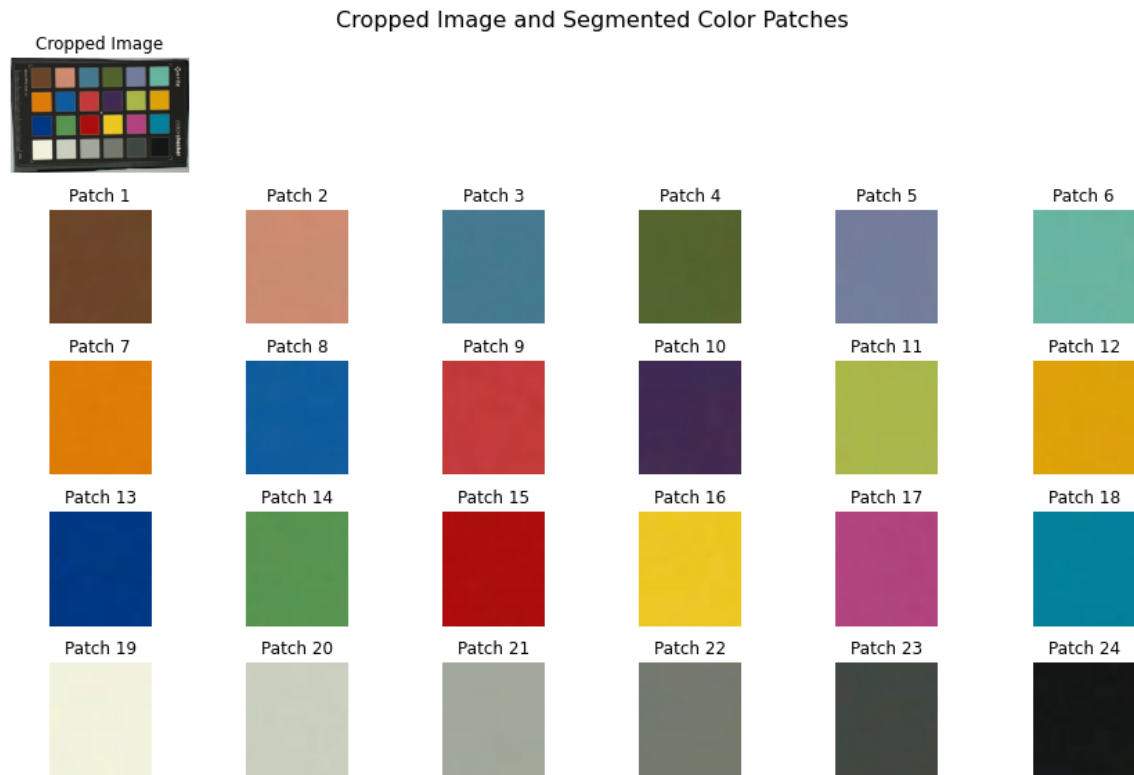


2. Reference RGB values of all 24 color patches

Reference R	Reference G	Reference B
115	82	68
194	150	130
98	122	157
87	108	67
133	128	177
103	189	170
214	126	44
80	91	166
193	90	99
94	60	108
157	188	64
224	163	46
56	61	150
70	148	73
175	54	60
231	199	31
187	86	149
8	133	161
243	243	242
200	200	200
160	160	160
122	122	121
85	85	85
52	52	52

B. Outputs:

Output 1. Cropped image and segmented color patches



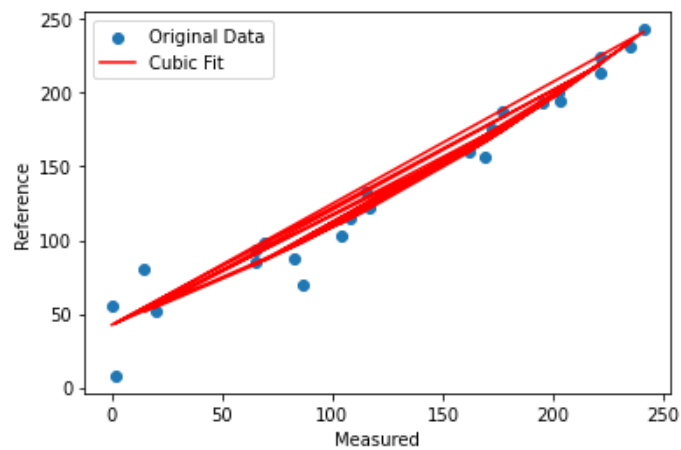
Output 2. Model fitting:

R - Linear model: $R^2=0.9492$, RMSE=14.3553

R - Quadratic model: $R^2=0.9580$, RMSE=13.0571

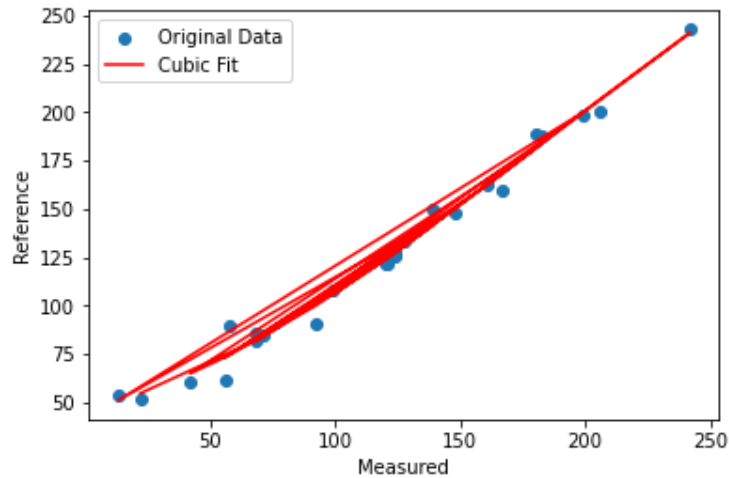
R - Cubic model: $R^2=0.9581$, RMSE=13.0474

Best model for R: $R_{\text{corrected}} = 1.5979e-06 * R^3 + 6.3165e-04 * R^2 + 5.8058e-01 * R + 4.2519e+01$



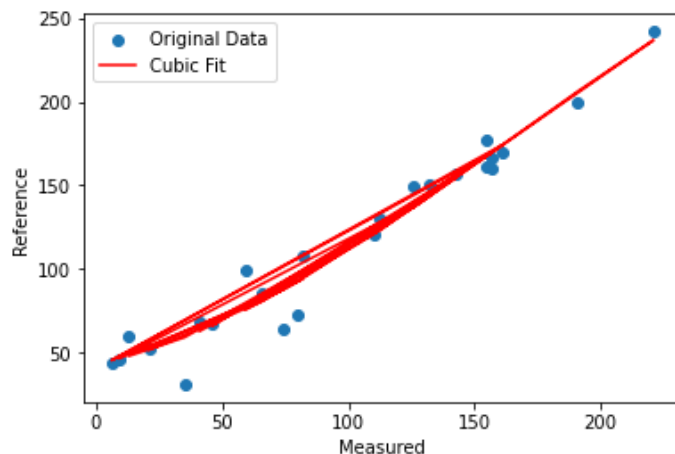
G - Linear model: $R^2=0.9774$, RMSE=7.7110
 G - Quadratic model: $R^2=0.9858$, RMSE=6.1128
 G - Cubic model: $R^2=0.9870$, RMSE=5.8628

Best model for G: $G_corrected = -6.7820e-06 * G^3 + 3.7672e-03 * G^2 + 2.9026e-01 * G + 4.6446e+01$



B - Linear model: $R^2=0.9459$, RMSE=13.0278
 B - Quadratic model: $R^2=0.9555$, RMSE=11.8195
 B - Cubic model: $R^2=0.9571$, RMSE=11.6042

Best model for B: $B_corrected = -9.8484e-06 * B^3 + 4.8126e-03 * B^2 + 2.9351e-01 * B + 4.3284e+01$



Generated Best-Fit Equations:

R: $R_corrected = 1.5979e-06 * R^3 + 6.3165e-04 * R^2 + 5.8058e-01 * R + 4.2519e+01$
 G: $G_corrected = -6.7820e-06 * G^3 + 3.7672e-03 * G^2 + 2.9026e-01 * G + 4.6446e+01$
 B: $B_corrected = -9.8484e-06 * B^3 + 4.8126e-03 * B^2 + 2.9351e-01 * B + 4.3284e+01$

Corrected RGB values saved to D:\PhD\Research topic\trials\camera selection\Final with Lab data\Logitech\video_clip\Corrected_values_1_1.xlsx

Total execution time: 1.00 seconds

Output 3. Measured RGB values

Measured R	Measured G	Measured B
108	68	41
203	139	112
69	121	143
83	99	46
115	124	155
104	180	161
221	124	6
15	92	157
195	58	59
65	42	82
169	183	74
221	161	9
0	56	132
87	148	80
172	13	13
235	199	35
177	68	126
2	128	155
241	242	221
202	206	191
162	167	157
117	120	110
65	71	66
20	22	21

Output 4. Corrected RGB values

Corrected R	Corrected G	Corrected B
115	81	63
200	141	123
86	125	155
96	106	66
120	127	168
112	181	174
219	127	45
51	100	170
192	75	75
83	65	94
166	184	87
219	163	46

43	73	143
99	150	93
169	51	48
235	200	59
174	81	137
44	131	168
241	241	237
199	207	206
160	168	170
122	124	121
83	84	81
54	55	51

Example 2:

A. Inputs:

1. Image of the Color Checker Chart



2. Reference RGB values of all 24 color patches

Reference R	Reference G	Reference B
115	82	68
194	150	130
98	122	157
87	108	67
133	128	177
103	189	170
214	126	44
80	91	166
193	90	99
94	60	108
157	188	64
224	163	46
56	61	150
70	148	73
175	54	60
231	199	31
187	86	149
8	133	161
243	243	242
200	200	200
160	160	160
122	122	121
85	85	85
52	52	52

B. Outputs:

Output 1. Cropped image and segmented color patches



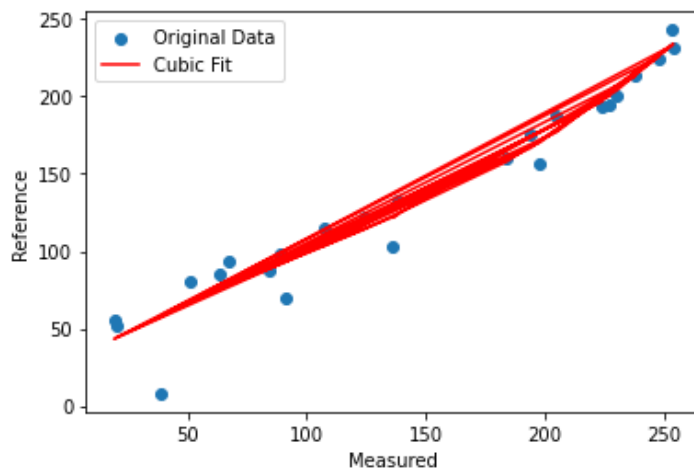
Output 2. Model fitting:

R - Linear model: $R^2=0.9385$, RMSE=15.7994

R - Quadratic model: $R^2=0.9455$, RMSE=14.8742

R - Cubic model: $R^2=0.9478$, RMSE=14.5514

Best model for R: $R_{\text{corrected}} = 1.0131e-05 * R^3 + -2.9635e-03 * R^2 + 9.1393e-01 * R + 2.6943e+01$

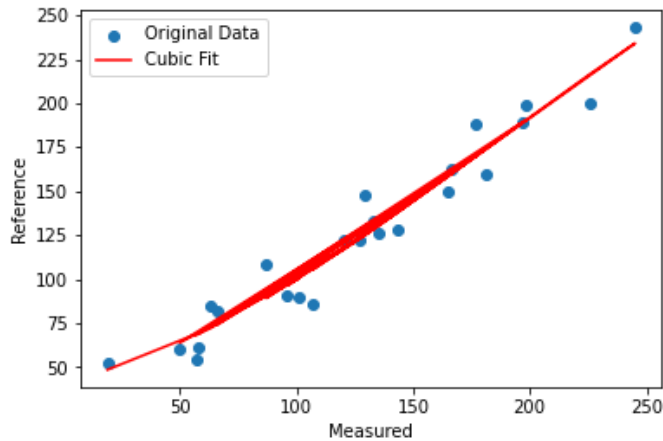


G - Linear model: $R^2=0.9436$, RMSE=12.1898

G - Quadratic model: $R^2=0.9495$, RMSE=11.5423

G - Cubic model: $R^2=0.9506$, RMSE=11.4173

Best model for G: $G_{\text{corrected}} = -7.1723\text{e-}06 * G^3 + 3.9242\text{e-}03 * G^2 + 2.5131\text{e-}01 * G + 4.2408\text{e+}01$

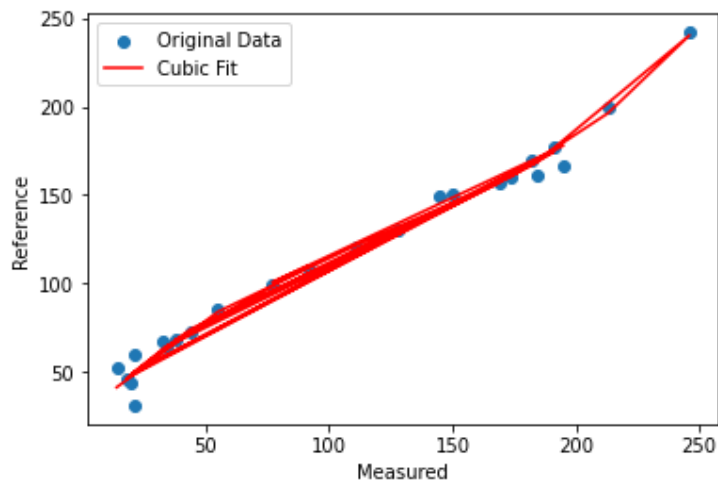


B - Linear model: $R^2=0.9763$, RMSE=8.6296

B - Quadratic model: $R^2=0.9773$, RMSE=8.4401

B - Cubic model: $R^2=0.9874$, RMSE=6.2986

Best model for B: $B_{\text{corrected}} = 2.1244\text{e-}05 * B^3 + -7.6568\text{e-}03 * B^2 + 1.4863\text{e+}00 * B + 2.1805\text{e+}01$



Generated Best-Fit Equations:

R: $R_{\text{corrected}} = 1.0131\text{e-}05 * R^3 + -2.9635\text{e-}03 * R^2 + 9.1393\text{e-}01 * R + 2.6943\text{e+}01$

G: $G_{\text{corrected}} = -7.1723\text{e-}06 * G^3 + 3.9242\text{e-}03 * G^2 + 2.5131\text{e-}01 * G + 4.2408\text{e+}01$

B: $B_{\text{corrected}} = 2.1244\text{e-}05 * B^3 + -7.6568\text{e-}03 * B^2 + 1.4863\text{e+}00 * B + 2.1805\text{e+}01$

Corrected RGB values saved to D:\PhD\Research topic\trials\camera selection\Final with Lab data\Lenovo\Corrected_values_1_1.xlsx

Total execution time: 1.39 seconds

Output 3: Measured RGB values

Measured R	Measured G	Measured B
107	66	38
227	165	128
89	127	169
84	87	33
138	143	191
136	197	182
238	135	20
51	96	195
224	101	77
67	50	92
198	177	34
248	166	18
19	58	150
91	129	44
194	57	21
254	198	21
205	107	145
39	133	184
253	245	246
230	226	213
184	181	174
124	120	111
63	63	55
20	19	14

Output 4: Corrected RGB values

Corrected R	Corrected G	Corrected B
103	74	68
200	158	131
92	123	157
89	89	63
123	138	174
122	189	167
213	130	49
67	96	178
197	100	101
78	64	110
170	170	64
226	159	46
43	69	144
93	125	74
167	68	50

234	190	50
177	105	141
59	128	168
233	234	240
204	217	196
158	174	161
114	117	121
75	72	84
44	49	41