

CORRIGENDUM 1

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Annex B

Replace the existing Annex B, by the following:

Annex B (informative)

Non-linear encoding for scRGB : scRGB-nl and its YCC Transformation: scYCC-nl

B.1 General

This annex describes non-linear encoding for scRGB: scRGB-nl and its YCC transformation: scYCC-nl. Applications and hardware developers who want to support various colour compression schemes based on luma-chroma-chroma spaces can utilise this standard. This transformation is targeted for compression and storage, and is not targeted for displaying images.

B.2 Non-linear encoding in 12-bit

The relationship is defined as follows:

If $R_{\text{scRGB}}, G_{\text{scRGB}}, B_{\text{scRGB}} \geq 0,003\ 130\ 8$

$$\begin{aligned} R'_{\text{scRGB}} &= 1,055 \times R_{\text{scRGB}}^{(1,0/2,4)} - 0,055 \\ G'_{\text{scRGB}} &= 1,055 \times G_{\text{scRGB}}^{(1,0/2,4)} - 0,055 \\ B'_{\text{scRGB}} &= 1,055 \times B_{\text{scRGB}}^{(1,0/2,4)} - 0,055 \end{aligned} \quad (\text{B.1})$$

If $0,003\ 130\ 8 > R_{\text{scRGB}}, G_{\text{scRGB}}, B_{\text{scRGB}} > -0,003\ 130\ 8$

$$\begin{aligned} R'_{\text{scRGB}} &= 12,92 \times R_{\text{scRGB}} \\ G'_{\text{scRGB}} &= 12,92 \times G_{\text{scRGB}} \\ B'_{\text{scRGB}} &= 12,92 \times B_{\text{scRGB}} \end{aligned} \quad (\text{B.2})$$

If $R_{\text{scRGB}}, G_{\text{scRGB}}, B_{\text{scRGB}} \leq -0,003\ 130\ 8$

$$\begin{aligned} R'_{\text{scRGB}} &= -1,055 \times (-R_{\text{scRGB}})^{(1,0/2,4)} + 0,055 \\ G'_{\text{scRGB}} &= -1,055 \times (-G_{\text{scRGB}})^{(1,0/2,4)} + 0,055 \\ B'_{\text{scRGB}} &= -1,055 \times (-B_{\text{scRGB}})^{(1,0/2,4)} + 0,055 \end{aligned} \quad (\text{B.3})$$

12 bit non-linear version of scRGB-nl: $R_{\text{scRGB-nl}}, G_{\text{scRGB-nl}}, B_{\text{scRGB-nl}}$ is defined as:

$$\begin{aligned} R_{\text{scRGB-nl}} &= \text{round}(1\ 280 \times R'_{\text{scRGB}} + 1\ 024) \\ G_{\text{scRGB-nl}} &= \text{round}(1\ 280 \times G'_{\text{scRGB}} + 1\ 024) \\ B_{\text{scRGB-nl}} &= \text{round}(1\ 280 \times B'_{\text{scRGB}} + 1\ 024) \end{aligned} \quad (\text{B.4})$$

For compression, scRGB-nl is converted to luma-chroma-chroma encoding: scYCC-nl.

$$\begin{bmatrix} Y'_{\text{scYCC}} \\ Cb'_{\text{scYCC}} \\ Cr'_{\text{scYCC}} \end{bmatrix} = \begin{bmatrix} 0,299\ 0 & 0,587\ 0 & 0,114\ 0 \\ -0,168\ 7 & -0,331\ 3 & 0,500\ 0 \\ 0,500\ 0 & -0,418\ 7 & -0,081\ 3 \end{bmatrix} \begin{bmatrix} R'_{\text{scRGB}} \\ G'_{\text{scRGB}} \\ B'_{\text{scRGB}} \end{bmatrix} \quad (\text{B.5})$$

And quantization for 12 bit non-linear scYCC-nl: $Y_{\text{scYCC-nl}}$, $Cb_{\text{scYCC-nl}}$, $Cr_{\text{scYCC-nl}}$ is defined as:

$$\begin{aligned} Y_{\text{scYCC-nl}} &= \text{round}(1\ 280 \times Y'_{\text{scYCC}} + 1\ 024) \\ Cb_{\text{scYCC-nl}} &= \text{round}(1\ 280 \times Cb'_{\text{scYCC}} + 2\ 048) \\ Cr_{\text{scYCC-nl}} &= \text{round}(1\ 280 \times Cr'_{\text{scYCC}} + 2\ 048) \end{aligned} \quad (\text{B.6})$$

Note that this quantization leads to the following relationships, where a value of 65 535 in scRGB₍₁₆₎ is equivalent to 7,499 9 in scRGB and 4 080 in scRGB-nl. This is to ease computational implementations.

Table B.1 – Quantization relationships using scRGB

scRGB ₍₁₆₎	scRGB	scR'G'B	scRGB-nl
N/A	−0,603 8	−0,800 0	0
0	−0,5	−0,735 4	83
2 048	−0,25	−0,537 1	337
4 096	0	0,000 0	1 024
12 288	1	1,000 0	2 304
20 480	2	1,353 3	2 756
28 672	3	1,612 5	3 088
36 864	4	1,824 8	3 360
45 056	5	2,008 0	3 594
53 248	6	2,170 8	3 803
61 440	7	2,318 4	3 992
65 535	7,499 9	2,387 6	4 080
N/A	7,5	2,387 7	4 080
N/A	7,591 3	2,400 0	4 096

Figure C.1 – Example workflow using scRGB

Replace, in the top line of Figure C.1, the words 'Output-referred colour', by the words 'Output-referred colour space'.