Equations: colorimetric data transfer from rgb_{d} to nce*$_{\mathrm{d}}$ data and LCH*$_{\mathrm{d}}$ data

Given: rgb_{d} device colour data of any colour rgb_{d} = lab*rgb_{d} and of 48 step colour circle j=0 to 47
$rgb_{\mathrm{Md,j}}$ and CIELAB data L*$_{\mathrm{Md,j}}$, C*$_{\mathrm{ab,Md,j}}$, $h_{\mathrm{ab,Md,j}}$ = LCH*$_{\mathrm{Md,j}}$
Aim: calculate nce*$_{\mathrm{d}}$ with (0<=n*$_{\mathrm{d}}$, c*$_{\mathrm{d}}$, e*$_{\mathrm{d}}$<=1) **(similar to NCS data) and LCH*$_{\mathrm{a,d}}$ data of the device colour**
Data of a given device (d) colour

relative chroma of the device colour	c*$_{\mathrm{d}} = max\,[\,rgb_{\mathrm{d}}\,] - min\,[\,rgb_{\mathrm{d}}\,]$		(1)
relative blackness of the device colour	n*$_{\mathrm{d}} = 1 - max\,[\,rgb_{\mathrm{d}}\,]$		(2)
relative triangle lightness of the device colour	t*$_{\mathrm{d}} = 1 - n$*$_{\mathrm{d}} - 0{,}5\ c$*$_{\mathrm{d}}$		(3)
relative red-green chroma in 6x60 degree system s	a*$_{\mathrm{rs,d}} = r_{\mathrm{d}}\ cos(30) + g_{\mathrm{d}}\ cos(150)$		(4)
relative yellow-blue chroma in 6x60 degree system s	b*$_{\mathrm{rs,d}} = r_{\mathrm{d}}\ sin(30) + g_{\mathrm{d}}\ sin(150) + b_{\mathrm{d}}\ sin(270)$		(5)
hue angle in 6x60 degree system s	$h_{\mathrm{ab,s,d}} = arctan(\,b$*$_{\mathrm{rs,d}} / a$*$_{\mathrm{rs,d}})$	(0<= $h_{\mathrm{ab,s,d}}$<=360)	(6)
hue number in 6x60 degree system s	e*$_{\mathrm{d}} = h_{\mathrm{ab,s,d}}/360$	(0<=e*$_{\mathrm{d}}$<=1)	(7)
CIELAB hue angle in device system	$h_{\mathrm{ab,d}}$ = function $[h_{\mathrm{ab,s,d}}]$	(with table/equations)	(8)
adapted CIELAB LCH*$_{\mathrm{d}}$ data of maximum colour M_{d}	L*$_{\mathrm{Md}}$ = function $[h_{\mathrm{ab,d}}]$	(with table/equations)	(9)
	C*$_{\mathrm{ab,Md}}$ = function $[h_{\mathrm{ab,d}}]$	(with table/equations)	(10)
	$h_{\mathrm{ab,Md}} = h_{\mathrm{ab,d}}$		(11)
relative lightness of maximum colour M_{d}	l*$_{\mathrm{Md}} = [\,L$*$_{\mathrm{Md}} - L$*$_{\mathrm{Nd}}\,] / [\,L$*$_{\mathrm{Wd}} - L$*$_{\mathrm{Nd}}\,]$		(12)
relative lightness of the device colour	l*$_{\mathrm{d}} = t$*$_{\mathrm{d}} + l$*$_{\mathrm{Md}}\ c$*$_{\mathrm{d}} + 0{,}5\ c$*$_{\mathrm{d}}$		(13)
CIELAB LCH*$_{\mathrm{d}}$ data of the device colour	L*$_{\mathrm{d}} = l$*$_{\mathrm{d}}\,[\,L$*$_{\mathrm{Wd}} - L$*$_{\mathrm{Nd}}\,] + L$*$_{\mathrm{Nd}}$		(14)
	C*$_{\mathrm{ab,d}} = c$*$_{\mathrm{d}}\ C$*$_{\mathrm{ab,Md}}$		(15)

SN870−3N

Equations: colorimetric data transfer from rgb_{e} to nce*$_{\mathrm{e}}$ data and LCH*$_{\mathrm{e}}$ data

Given: rgb_{e} elementary colour data of any colour rgb_{e} = lab*rgb_{e} and of 48 step colour circle j=0 to 47
$rgb_{\mathrm{Me,j}}$ and CIELAB data L*$_{\mathrm{Me,j}}$, C*$_{\mathrm{ab,Me,j}}$, $h_{\mathrm{ab,Me,j}}$ = LCH*$_{\mathrm{Me,j}}$
Aim: calculate nce*$_{\mathrm{e}}$ with (0<=n*$_{\mathrm{e}}$, c*$_{\mathrm{e}}$, e*$_{\mathrm{e}}$<=1) **(similar to NCS data) and LCH*$_{\mathrm{a,e}}$ data of elementary colour**
Data of a give elementary (e) colour

relative chroma of the elementary colour	c*$_{\mathrm{e}} = max\,[\,rgb_{\mathrm{e}}\,] - min\,[\,rgb_{\mathrm{e}}\,]$		(1)
relative blackness of the elementary colour	n*$_{\mathrm{e}} = 1 - max\,[\,rgb_{\mathrm{e}}\,]$		(2)
relative triangle lightness of the elementary colour	t*$_{\mathrm{e}} = 1 - n$*$_{\mathrm{e}} - 0{,}5\ c$*$_{\mathrm{e}}$		(3)
relative red-green chroma in 4x90 degree system s	a*$_{\mathrm{rs,e}} = r_{\mathrm{e}}\ cos(0) + g_{\mathrm{e}}\ cos(180)$		(4)
relative yellow-blue chroma in 4x90 degree system s	b*$_{\mathrm{rs,e}} = r_{\mathrm{e}}\ sin(0) + g_{\mathrm{e}}\ sin(180) + b_{\mathrm{e}}\ sin(270)$		(5)
hue angle in 4x90 degree system s	$h_{\mathrm{ab,s,e}} = arctan(\,b$*$_{\mathrm{rs,e}} / a$*$_{\mathrm{rs,e}})$	(0<= $h_{\mathrm{ab,s,e}}$<=360)	(6)
hue number in 4x90 degree system s	e*$_{\mathrm{e}} = h_{\mathrm{ab,s,e}}/360$	(0<=e*$_{\mathrm{e}}$<=1)	(7)
CIELAB hue angle in elementary system	$h_{\mathrm{ab,e}}$ = function $[h_{\mathrm{ab,s,e}}]$	(with table/equations)	(8)
CIELAB LCH*$_{\mathrm{e}}$ data of maximum colour M_{e}	L*$_{\mathrm{Me}}$ = function $[h_{\mathrm{ab,e}}]$	(with table/equations)	(9)
	C*$_{\mathrm{ab,Me}}$ = function $[h_{\mathrm{ab,e}}]$	(with table/equations)	(10)
	$h_{\mathrm{ab,Me}} = h_{\mathrm{ab,e}}$		(11)
relative lightness of maximum colour M_{e}	l*$_{\mathrm{Me}} = [\,L$*$_{\mathrm{Me}} - L$*$_{\mathrm{Ne}}\,] / [\,L$*$_{\mathrm{We}} - L$*$_{\mathrm{Ne}}\,]$		(12)
relative lightness of the elementary colour	l*$_{\mathrm{e}} = t$*$_{\mathrm{e}} + l$*$_{\mathrm{Me}}\ c$*$_{\mathrm{e}} + 0{,}5\ c$*$_{\mathrm{e}}$		(13)
CIELAB LCH*$_{\mathrm{e}}$ data of the elementary colour	L*$_{\mathrm{e}} = l$*$_{\mathrm{e}}\,[\,L$*$_{\mathrm{We}} - L$*$_{\mathrm{Ne}}\,] + L$*$_{\mathrm{Ne}}$		(14)
	C*$_{\mathrm{ab,a}} = c$*$_{\mathrm{e}}\ C$*$_{\mathrm{ab,Me}}$		(15)

SN871−3N

Equations: colorimetric data transfer from rgb_{d} to nce*$_{\mathrm{d}}$ data and LCH*$_{\mathrm{a,d}}$ data

Given: rgb_{d} device colour data of any colour rgb_{d} = lab*rgb_{d} and of 48 step colour circle j=0 to 47
$rgb_{\mathrm{Md,j}}$ and adapted CIELAB data L*$_{\mathrm{Md,j}}$, C*$_{\mathrm{ab,a,Md,j}}$, $h_{\mathrm{ab,a,Md,j}}$ = LCH*$_{\mathrm{a,Md,j}}$
Aim: calculate nce*$_{\mathrm{d}}$ with (0<=n*$_{\mathrm{d}}$, c*$_{\mathrm{d}}$, e*$_{\mathrm{d}}$<=1) **(similar to NCS data) and LCH*$_{\mathrm{a,d}}$ data of the device colour**
Data of a given device (d) colour

relative chroma of the device colour	c*$_{\mathrm{d}} = max\,[\,rgb_{\mathrm{d}}\,] - min\,[\,rgb_{\mathrm{d}}\,]$		(1)
relative blackness of the device colour	n*$_{\mathrm{d}} = 1 - max\,[\,rgb_{\mathrm{d}}\,]$		(2)
relative triangle lightness of the device colour	t*$_{\mathrm{d}} = 1 - n$*$_{\mathrm{d}} - 0{,}5\ c$*$_{\mathrm{d}}$		(3)
relative red-green chroma in 6x60 degree system s	a*$_{\mathrm{rs,d}} = r_{\mathrm{d}}\ cos(30) + g_{\mathrm{d}}\ cos(150)$		(4)
relative yellow-blue chroma in 6x60 degree system s	b*$_{\mathrm{rs,d}} = r_{\mathrm{d}}\ sin(30) + g_{\mathrm{d}}\ sin(150) + b_{\mathrm{d}}\ sin(270)$		(5)
hue angle in 6x60 degree system s	$h_{\mathrm{ab,s,d}} = arctan(\,b$*$_{\mathrm{rs,d}} / a$*$_{\mathrm{rs,d}})$	(0<= $h_{\mathrm{ab,s,d}}$<=360)	(6)
hue number in 6x60 degree system s	e*$_{\mathrm{d}} = h_{\mathrm{ab,s,d}}/360$	(0<=e*$_{\mathrm{d}}$<=1)	(7)
CIELAB hue angle in device system	$h_{\mathrm{ab,a,d}}$ = function $[h_{\mathrm{ab,s,d}}]$	(with table/equations)	(8)
adapted CIELAB LCH*$_{\mathrm{a,d}}$ data of maximum colour M_{d}	L*$_{\mathrm{Md}}$ = function $[h_{\mathrm{ab,a,d}}]$	(with table/equations)	(9)
	C*$_{\mathrm{ab,a,Md}}$ = function $[h_{\mathrm{ab,a,d}}]$	(with table/equations)	(10)
	$h_{\mathrm{ab,a,Md}} = h_{\mathrm{ab,a,d}}$		(11)
relative lightness of maximum colour M_{d}	l*$_{\mathrm{Md}} = [\,L$*$_{\mathrm{Md}} - L$*$_{\mathrm{Nd}}\,] / [\,L$*$_{\mathrm{Wd}} - L$*$_{\mathrm{Nd}}\,]$		(12)
relative lightness of the device colour	l*$_{\mathrm{d}} = t$*$_{\mathrm{d}} + l$*$_{\mathrm{Md}}\ c$*$_{\mathrm{d}} + 0{,}5\ c$*$_{\mathrm{d}}$		(13)
adapted CIELAB LCH*$_{\mathrm{a,d}}$ data of the device colour	L*$_{\mathrm{d}} = l$*$_{\mathrm{d}}\,[\,L$*$_{\mathrm{Wd}} - L$*$_{\mathrm{Nd}}\,] + L$*$_{\mathrm{Nd}}$		(14)
	C*$_{\mathrm{ab,a,d}} = c$*$_{\mathrm{d}}\ C$*$_{\mathrm{ab,a,Md}}$		(15)

SN870−7N

Equations: colorimetric data transfer from rgb_{e} to nce*$_{\mathrm{e}}$ data and LCH*$_{\mathrm{a,e}}$ data

Given: rgb_{e} elementary colour data of any colour rgb_{e} = lab*rgb_{e} and of 48 step colour circle j=0 to 47
$rgb_{\mathrm{Me,j}}$ and adapted CIELAB data L*$_{\mathrm{Me,j}}$, C*$_{\mathrm{ab,a,Me,j}}$, $h_{\mathrm{ab,a,Me,j}}$ = LCH*$_{\mathrm{a,Me,j}}$
Aim: calculate nce*$_{\mathrm{e}}$ with (0<=n*$_{\mathrm{e}}$, c*$_{\mathrm{e}}$, e*$_{\mathrm{e}}$<=1) **(similar to NCS data) and LCH*$_{\mathrm{a,e}}$ data of elementary colour**
Data of a given elementary (e) colour

relative chroma of the elementary colour	c*$_{\mathrm{e}} = max\,[\,rgb_{\mathrm{e}}\,] - min\,[\,rgb_{\mathrm{e}}\,]$		(1)
relative blackness of the elementary colour	n*$_{\mathrm{e}} = 1 - max\,[\,rgb_{\mathrm{e}}\,]$		(2)
relative triangle lightness of the elementary colour	t*$_{\mathrm{e}} = 1 - n$*$_{\mathrm{e}} - 0{,}5\ c$*$_{\mathrm{e}}$		(3)
relative red-green chroma in 4x90 degree system s	a*$_{\mathrm{rs,e}} = r_{\mathrm{e}}\ cos(0) + g_{\mathrm{e}}\ cos(180)$		(4)
relative yellow-blue chroma in 4x90 degree system s	b*$_{\mathrm{rs,e}} = r_{\mathrm{e}}\ sin(0) + g_{\mathrm{e}}\ sin(180) + b_{\mathrm{e}}\ sin(270)$		(5)
hue angle in 4x90 degree system s	$h_{\mathrm{ab,s,e}} = arctan(\,b$*$_{\mathrm{rs,e}} / a$*$_{\mathrm{rs,e}})$	(0<= $h_{\mathrm{ab,s,e}}$<=360)	(6)
hue number in 4x90 degree system s	e*$_{\mathrm{e}} = h_{\mathrm{ab,s,e}}/360$	(0<=e*$_{\mathrm{e}}$<=1)	(7)
CIELAB hue angle in elementary system	$h_{\mathrm{ab,a,e}}$ = function $[h_{\mathrm{ab,s,e}}]$	(with table/equations)	(8)
adapted CIELAB LCH*$_{\mathrm{a,e}}$ data of maximum colour M_{e}	L*$_{\mathrm{Me}}$ = function $[h_{\mathrm{ab,a,e}}]$	(with table/equations)	(9)
	C*$_{\mathrm{ab,a,Me}}$ = function $[h_{\mathrm{ab,a,e}}]$	(with table/equations)	(10)
	$h_{\mathrm{ab,a,Me}} = h_{\mathrm{ab,a,e}}$		(11)
relative lightness of maximum colour M_{e}	l*$_{\mathrm{Me}} = [\,L$*$_{\mathrm{Me}} - L$*$_{\mathrm{Ne}}\,] / [\,L$*$_{\mathrm{We}} - L$*$_{\mathrm{Ne}}\,]$		(12)
relative lightness of the elementary colour	l*$_{\mathrm{e}} = t$*$_{\mathrm{e}} + l$*$_{\mathrm{Me}}\ c$*$_{\mathrm{e}} + 0{,}5\ c$*$_{\mathrm{e}}$		(13)
adapted CIELAB LCH*$_{\mathrm{a,e}}$ data of the elementary colour	L*$_{\mathrm{e}} = l$*$_{\mathrm{e}}\,[\,L$*$_{\mathrm{We}} - L$*$_{\mathrm{Ne}}\,] + L$*$_{\mathrm{Ne}}$		(14)
	C*$_{\mathrm{ab,a,d}} = c$*$_{\mathrm{e}}\ C$*$_{\mathrm{ab,a,Me}}$		(15)

SN871−7N

input: *w/rgb/cmyk −> w/rgb/cmyk*
output: no change compared