Equations: colorimetric data transfer from rgb_{d} to nce^*_{d} data and LCH^*_{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^*_{d} with (0<=n^*_{d}, c^*_{d}, e^*_{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^*_{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^*_{d} data of maximum colour M_{d}	L^*_{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^*_{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)

SI870−3N

Equations: colorimetric data transfer from rgb_{e} to nce^*_{e} data and LCH^*_{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^*_{e} with (0<=n^*_{e}, c^*_{e}, e^*_{e}<=1) **(similar to NCS data) and LCH^*_{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	$h_{\mathrm{ab,s,e}} = arctant[\,b^*_{\mathrm{rs,e}} / a^*_{\mathrm{rs,e}}]$ (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^*_{e}<=1)	(7)
CIELAB hue angle in elementary system	$h_{\mathrm{ab,a,e}}$ = function $[h_{\mathrm{ab,s,e}}]$ (with table/equations)	(8)
CIELAB LCH^*_{e} data of maximum colour M_{e}	L^*_{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^*_{e} data of the elementary colour	$L^*_{\mathrm{e}} = l^*_{\mathrm{e}}\,[\,L^*_{\mathrm{We}} - L^*_{\mathrm{Ne}}\,] + L^*_{\mathrm{Ne}}$	(14)
	$C^*_{\mathrm{ab,a,e}} = c^*_{\mathrm{e}}\,C^*_{\mathrm{ab,a,Me}}$	(15)

SI871−3N

Equations: colorimetric data transfer from rgb_{d} to $nce^*_{\mathrm{a,d}}$ 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 $nce^*_{\mathrm{a,d}}$ with (0<=n^*_{d}, c^*_{d}, e^*_{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	$h_{\mathrm{ab,s,d}} = arctant[\,b^*_{\mathrm{rs,d}} / a^*_{\mathrm{rs,d}}]$ (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^*_{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^*_{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)

SI870−7N

Equations: colorimetric data transfer from rgb_{e} to $nce^*_{\mathrm{a,e}}$ 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^*_{e} with (0<=n^*_{e}, c^*_{e}, e^*_{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	$h_{\mathrm{ab,s,e}} = arctant[\,b^*_{\mathrm{rs,e}} / a^*_{\mathrm{rs,e}}]$ (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^*_{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^*_{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)
	$C^*_{\mathrm{ab,a,e}} = c^*_{\mathrm{e}}\,C^*_{\mathrm{ab,a,Me}}$	(15)

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