Package 'colorscience'

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Type Package

Title Color Science methods and data

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Maintainer Jose Gama <jgama@abo.fi>

Description Methods and data for color science - color conversions by observer,illuminant and gamma. Color matching functions and chromaticity diagrams. Color indices, color differences and spectral data conversion/analysis.

License GPL (>= 3)

Depends R (>= 2.10), Hmisc, munsellinterpol, pracma

Enhances png

LazyData yes

Author Jose Gama [aut, cre]

NeedsCompilation no

Repository CRAN

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R topics documented:

ASTM.D1925.YellownessIndex

ASTM D 1925 Yellowness Index for Plastics

Description

ASTM.D1925.YellownessIndex was developed for the definition of the Yellowness of homogeneous, non-fluorescent, almost neutral-transparent, white-scattering or opaque plastics as they will be reviewed under daylight condition.

Usage

```
ASTM.D1925.YellownessIndex(XYZmatrix)
```

Arguments

XYZmatrix	tri-stimulus values for the calculated for illuminant C

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
XYZ<-c(0.1146538, 0.08391198, 0.08222077)
ASTM.D1925.YellownessIndex(XYZ)
```

ASTM.E313.Whiteness *ASTM E313 Whiteness*

Description

`ASTM.E313.Whiteness` ASTM E313 Whiteness.

Usage

```
ASTM.E313.Whiteness(XYZmatrix)
```

Arguments

`XYZmatrix`	tri-stimulus values for the calculated for illuminant C

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
XYZ<-c(0.1146538, 0.08391198, 0.08222077)
ASTM.E313.Whiteness(XYZ)
```

ASTM.E313.YellownessIndex *ASTM E313 Yellowness*

Description

`ASTM.E313.YellownessIndex` ASTM E313 has successfully been used for a variety of white or near white materials.

Usage

```
ASTM.E313.YellownessIndex(XYZmatrix)
```

Arguments

XYZmatrix	tri-stimulus values for the calculated for illuminant C

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
XYZ<-c(0.1146538, 0.08391198, 0.08222077)
ASTM.E313.YellownessIndex(XYZ)
```

Berger59.Whiteness *Berger (59) Whiteness*

Description

Berger59.Whiteness formula was developed by A. Berger (formerly employee of Bayer AG, Germany and was presented in 1959.

Usage

```
Berger59.Whiteness(xyYmatrix, illuminant = "C", observer = 2, RefWhite =
                 XYZperfectreflectingdiffuser)
```

Arguments

xyYmatrix	CIE values for illuminant C
illuminant	illuminant
observer	observer
RefWhite	White Reference

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
Berger59.Whiteness(xyY)
```

`cccie31` *CIE (1931) 2-deg chromaticity coordinates*

Description

`cccie31` is a table with CIE (1931) 2-deg chromaticity coordinates.

Usage

```
cccie31
```

Format

This data frame contains the following data:

wlnm wavelength (nm)

x x chromaticity coordinate

y y chromaticity coordinate

z z chromaticity coordinate

Author(s)

Jose Gama

Source

Commission Internationale de l'Eclairage Proceedings, 1931 Cambridge: Cambridge University Press.

References

Commission Internationale de l'Eclairage Proceedings, 1931 Cambridge: Cambridge University Press.

Examples

```
data(cccie31)
cccie31
```

---

cccie64 *CIE (1964) 10-deg chromaticity coordinates*

Description

cccie64 is a table with CIE (1964) 10-deg chromaticity coordinates.

Usage

```
cccie64
```

Format

This data frame contains the following data:

wlnm wavelength (nm)

x x chromaticity coordinate

y y chromaticity coordinate

z z chromaticity coordinate

Author(s)

Jose Gama

Source

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

References

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

Examples

```
data(cccie64)
cccie64
```

CCT2XYZ *Convert CCT to XYZ*

Description

CCT2XYZ Converts correlated color temperature (CCT) to CIE tristimulus XYZ.

Usage

```
CCT2XYZ(CCTmatrix)
```

Arguments

CCTmatrix	CCT values

Value

CIE tristimulus XYZ

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

References

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

Examples

```
CCT2XYZ(c(0.310897, 0.306510, 74.613450))
```

ChromaticAdaptation *Chromatic adaptation algorithms*

Description

ChromaticAdaptation chromatic adaptation algorithms implemented as a linear transformation (XYZ Scaling, Bradford and Von Kries).

Usage

```
ChromaticAdaptation
```

Format

This array frame contains the following dimensions:

1 rows transformation matrix 3x3

2 columns transformation matrix 3x3

3 linear transformation (XYZ Scaling, Bradford or Von Kries)

4 transformation "direct" or "inverse"

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

References

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

Examples

```
data(ChromaticAdaptation)
ChromaticAdaptation
```

CIE.Whiteness *CIE Whiteness*

Description

`CIE.Whiteness` The CIE Whiteness index is widely used in the industry for D65 for 2 or 10 deg observer.

Usage

```
CIE.Whiteness(xyYmatrix, illuminant = "D65", observer = 2, RefWhite
                = XYZperfectreflectingdiffuser)
```

Arguments

`xyYmatrix`	xyY data
`illuminant`	illuminant
`observer`	observer
`RefWhite`	Reference White

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
CIE.Whiteness(xyY)
```

CIE1931xy2CIE1960uv *Convert CIE 1931 xy color space to CIE 1960 uv color space*

Description

CIE1931xy2CIE1960uv Converts CIE 1931 xy color space to CIE 1960 uv color space.

Usage

```
CIE1931xy2CIE1960uv(xymatrix)
```

Arguments

xymatrix	xy coordinates

Value

CIE 1960 uv coordinates

Author(s)

Jose Gama

Source

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

References

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

Examples

```
xyY <- cbind(0.4083308, 0.2988462, 0.08391198)
CIE1931xy2CIE1960uv(xyY)
```

`CIE1931xy2CIE1976uv` *Convert CIE 1931 xy color space to CIE 1976 uv color space*

Description

`CIE1931xy2CIE1976uv` Converts CIE 1931 xy color space to CIE 1976 uv color space.

Usage

```
CIE1931xy2CIE1976uv(xymatrix)
```

Arguments

`xymatrix`	xy coordinates

Value

CIE 1976 uv coordinates

Author(s)

Jose Gama

Source

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

References

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

Examples

```
xyY <- cbind(0.4083308, 0.2988462, 0.08391198)
CIE1931xy2CIE1976uv(xyY)
```

CIE1931XYZ2CIE1931xyz *Convert CIE 1931 XYZ color space to CIE 1931 xyz color space*

Description

CIE1931XYZ2CIE1931xyz Converts CIE 1931 XYZ color space to CIE 1931 xyz color space.

Usage

```
CIE1931XYZ2CIE1931xyz(XYZmatrix)
```

Arguments

XYZmatrix	XYZ coordinates

Value

CIE 1931 xyz coordinates

Author(s)

Jose Gama

Source

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

References

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
CIE1931XYZ2CIE1931xyz(XYZ)
```

CIE1931XYZ2CIE1960uv *Convert CIE 1931 XYZ color space to CIE 1960 uv color space*

Description

CIE1931XYZ2CIE1960uv Converts CIE 1931 XYZ color space to CIE 1960 uv color space.

Usage

```
CIE1931XYZ2CIE1960uv(XYZmatrix)
```

Arguments

XYZmatrix	XYZ coordinates

Value

CIE 1960 uv coordinates

Author(s)

Jose Gama

Source

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

References

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
CIE1931XYZ2CIE1960uv(XYZ)
```

CIE1931XYZ2CIE1976uv *Convert CIE 1931 XYZ color space to CIE 1976 uv color space*

Description

CIE1931XYZ2CIE1976uv Converts CIE 1931 XYZ color space to CIE 1976 uv color space.

Usage

```
CIE1931XYZ2CIE1976uv(XYZmatrix)
```

Arguments

XYZmatrix	XYZ coordinates

Value

CIE 1976 uv coordinates

Author(s)

Jose Gama

Source

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

References

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
CIE1931XYZ2CIE1976uv(XYZ)
```

CIE1960UCS2CIE1964 *Convert CIE 1960 UCS color space to CIE 1964 color space*

Description

CIE1960UCS2CIE1964 Converts CIE 1960 UCS color space to CIE 1964 color space.

Usage

```
CIE1960UCS2CIE1964(uvYmatrix, illuminant = "D65", observer = 2, RefWhite =
                XYZperfectreflectingdiffuser)
```

Arguments

uvYmatrix	uvY data
illuminant	illuminant
observer	observer
RefWhite	Reference White

Value

CIE 1976 uv coordinates

Author(s)

Jose Gama

Source

Wikipedia, 2014 CIE 1964 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

References

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

Examples

```
CIE1960UCS2CIE1964(c(0.1633789, 1.322222, 0.08391198))
```

CIE1960UCS2xy *Convert CIE 1960 UCS color space to 1960 xy color space*

Description

CIE1960UCS2xy Converts CIE 1960 UCS color space to 1960 xy color space.

Usage

```
CIE1960UCS2xy(uvMatrix)
```

Arguments

uvMatrix	uv coordinates

Value

CIE 1960 xy coordinates

Author(s)

Jose Gama

Source

Wikipedia, 2014 CIE 1964 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

References

Wikipedia, 2014 CIE 1931 color space http://en.wikipedia.org/wiki/CIE_1931_color_space#CIE_xy_chromaticity_diagram_and_the_CIE_xyY_color_space

Examples

```
CIE1960UCS2xy(c(0.1633789, 1.322222 ))
```

CIE1976chroma *CIE 1976 chroma formula for CIELab and CIELuv*

Description

CIE1976chroma CIE 1976 chroma formula for CIELab and CIELuv.

Usage

```
CIE1976chroma(CIELMatrix)
```

Arguments

CIELMatrix	CIELab or CIELuv data

Author(s)

Jose Gama

Source

R. W. G. Hunt, M. R. Pointer, 2011 Measuring Colour Volume 23 of The Wiley-IS&T Series in Imaging Science and Technology John Wiley & Sons

References

R. W. G. Hunt, M. R. Pointer, 2011 Measuring Colour Volume 23 of The Wiley-IS&T Series in Imaging Science and Technology John Wiley & Sons

Examples

```
CIELMatrix<-c(34.78467, 28.15159, 3.024663)
CIE1976chroma(CIELMatrix)
```

CIE1976hueangle *CIE 1976 hue angle formula for CIELab and CIELuv*

Description

CIE1976hueangle CIE 1976 hue angle formula for CIELab and CIELuv.

Usage

```
CIE1976hueangle(CIELMatrix)
```

Arguments

CIELMatrix	CIELab or CIELuv data

Author(s)

Jose Gama

Source

R. W. G. Hunt, M. R. Pointer, 2011 Measuring Colour Volume 23 of The Wiley-IS&T Series in Imaging Science and Technology John Wiley & Sons

References

R. W. G. Hunt, M. R. Pointer, 2011 Measuring Colour Volume 23 of The Wiley-IS&T Series in Imaging Science and Technology John Wiley & Sons

Examples

```
CIELMatrix<-c(34.78467, 28.15159, 3.024663)
CIE1976hueangle(CIELMatrix)
```

CIE1976uv2CIE1931xy *CIE-1976 u'v' to CIE-1931 xy*

Description

CIE1976uv2CIE1931xy CIE-1976 u'v' to CIE-1931 xy.

Usage

```
CIE1976uv2CIE1931xy(uvmatrix)
```

Arguments

uvmatrix	CIE-1976 u'v' data

Author(s)

Jose Gama

Source

Paul Schils, 2014 Color theory phenomena http://www.color-theory-phenomena.nl/10.03.htm

References

Paul Schils, 2014 Color theory phenomena http://www.color-theory-phenomena.nl/10.03.htm

Examples

```
CIE1976uv2CIE1931xy(c(0.2830965, 0.4661789))
```

CIE1976uv2CIE1960uv *CIE-1976 u'v' to CIE-1960 uv*

Description

CIE1976uv2CIE1960uv CIE-1976 u'v' to CIE-1960 uv.

Usage

```
CIE1976uv2CIE1960uv(uvmatrix)
```

Arguments

uvmatrix	CIE-1976 u'v' data

Author(s)

Jose Gama

Source

Paul Schils, 2014 Color theory phenomena http://www.color-theory-phenomena.nl/10.03.htm

References

Paul Schils, 2014 Color theory phenomena http://www.color-theory-phenomena.nl/10.03.htm

Examples

```
CIE1976uv2CIE1960uv(c(0.2830965, 0.4661789))
```

CIE1976uvSaturation *CIE 1976 uv Saturation*

Description

CIE1976uvSaturation CIE 1976 uv Saturation.

Usage

```
CIE1976uvSaturation(uvMatrix, whitepoint)
```

Arguments

uvMatrix	CIELuv data
whitepoint	white point

Author(s)

Jose Gama

Source

R. W. G. Hunt, M. R. Pointer, 2011 Measuring Colour Volume 23 of The Wiley-IS&T Series in Imaging Science and Technology John Wiley & Sons

References

R. W. G. Hunt, M. R. Pointer, 2011 Measuring Colour Volume 23 of The Wiley-IS&T Series in Imaging Science and Technology John Wiley & Sons

Examples

```
CIE1976uvSaturation(cbind(34.78467, 28.15159, 3.024663), as.numeric(
XYZperfectreflectingdiffuser[which(XYZperfectreflectingdiffuser[["Illuminant"]]==
'C'),c('X2','Y2')]))
```

CIELabtoDIN99 *Conversion from CIELAB color space to DIN99 coordinates*

Description

CIELabtoDIN99 Converts from CIELAB color space to DIN99 coordinates.

Usage

```
CIELabtoDIN99(Lab)
```

Arguments

Lab	CIELAB

Value

DIN99

Author(s)

Jose Gama

Source

CIELAB to DIN99 coordinates, 2014 http://de.wikipedia.org/w/index.php?title=Diskussion:DIN99-Farbraum

References

CIELAB to DIN99 coordinates, 2014 http://de.wikipedia.org/w/index.php?title=Diskussion:DIN99-Farbraum

Examples

```
CIELabtoDIN99(c(0.310897, 0.306510, 74.613450))
```

CIEluminanceY2NCSblackness

approximated NCS blackness s by the CIE luminance factor Y

Description

CIEluminanceY2NCSblackness approximated NCS blackness s by the CIE luminance factor Y.

Usage

```
CIEluminanceY2NCSblackness(Y)
```

Arguments

Y	CIE values for illuminant C

Author(s)

Jose Gama

Source

Hsien-Che Lee, 2005 Introduction to Color Imaging Science Cambridge University Press pp. 366

References

Hsien-Che Lee, 2005 Introduction to Color Imaging Science Cambridge University Press pp. 366

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
CIEluminanceY2NCSblackness(xyY[3])
```

`CIETint` *Tint indices: CIE Tint and ASTM E313 Tint*

Description

`CIETint` Tint indices: CIE Tint and ASTM E313 Tint.

Usage

```
CIETint(xymatrix,illuminant='D65',observer=2)
```

Arguments

`xymatrix`	matrix with xy data
`illuminant`	illuminant
`observer`	observer

Value

Tint

Author(s)

Jose Gama

Source

CIE, 2004 CIE Publication 15:2004, "Colorimetry" ASTM E313, "Standard Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates"

References

CIE, 2004 CIE Publication 15:2004, "Colorimetry" ASTM E313, "Standard Practice for Calculating Yellowness and Whiteness Indices from Instrumentally Measured Color Coordinates"

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
CIETint(xyY)
```

ciexyz31 *CIE 1931 2-deg, XYZ CMFs*

Description

ciexyz31 is a table with CIE 1931 2-deg, XYZ color matching functions.

Usage

```
ciexyz31
```

Format

This data frame contains the following data:

wlnm wavelength (nm)

xbar x CMF

ybar y CMF

zbar z CMF

Author(s)

Jose Gama

Source

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

References

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

Examples

```
data(ciexyz31)
ciexyz31
```

`ciexyz64` *CIE 1964 10-deg, XYZ CMFs*

Description

`ciexyz64` is a table with CIE 1964 10-deg, XYZ color matching functions.

Usage

```
ciexyz64
```

Format

This data frame contains the following data:

wlnm wavelength (nm)

xbar x CMF

ybar y CMF

zbar z CMF

Author(s)

Jose Gama

Source

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

References

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

Examples

```
data(ciexyz64)
ciexyz64
```

CMY2CMYK *Convert CMY coordinates to CMYK*

Description

CMY2CMYK Converts CMY coordinates to CMYK.

Usage

```
CMY2CMYK(CMYmatrix)
```

Arguments

CMYmatrix	CMY coordinates

Value

CMYK coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
CMY2CMYK(c(0.59072, 0.85570, 0.80283))
```

CMY2RGB *Convert CMYK coordinates to RGB*

Description

CMY2RGB Converts CMYK coordinates to RGB.

Usage

```
CMY2RGB(CMYmatrix)
```

Arguments

CMYmatrix	CMY coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
CMY2RGB(c(0.310897, 0.306510, 74.613450))
```

CMYK2CMY *Convert CMYK coordinates to CMY*

Description

CMYK2CMY Converts CMYK coordinates to CMY.

Usage

```
CMYK2CMY(CMYKmatrix)
```

Arguments

CMYKmatrix	CMYK coordinates

Value

CMY coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
CMYK2CMY(c(.342, .768, .683, .378))
```

---

compuphaseDifferenceRGB

compuphase Difference RGB

Description

compuphaseDifferenceRGB compuphase Difference RGB.

Usage

```
compuphaseDifferenceRGB(RGB1, RGB2)
```

Arguments

RGB1	RGB color sample
RGB2	RGB color reference

Value

Delta E

Author(s)

Jose Gama

Source

Thiadmer Riemersma, 2012 CompuPhase http://www.compuphase.com/cmetric.htm

References

Thiadmer Riemersma, 2012 CompuPhase http://www.compuphase.com/cmetric.htm

Examples

```
compuphaseDifferenceRGB(c(124,63,78),c(241,65,78))
```

`conversionIlluminance` *Conversion Factors for Units of Illuminance*

Description

`conversionIlluminance` is a table of conversion factors for units of Illuminance

Usage

```
conversionIlluminance
```

Format

This data frame contains the following columns:

footcandles foot-candles

lux lm/m2 = lux

phot phot

milliphot milliphot

units units

Author(s)

Jose Gama

Source

J. Meyer-Arendt, "Radiometry and Photometry: Units and Conversion Factors," Appl. Opt. 7, 2081-2081 (1968).

References

J. Meyer-Arendt, "Radiometry and Photometry: Units and Conversion Factors," Appl. Opt. 7, 2081-2081 (1968).

Examples

```
data(conversionIlluminance)
conversionIlluminance
```

`conversionLuminance` *Conversion Factors for Units of Luminance*

Description

`conversionLuminance` is a table of conversion factors for units of Luminance

Usage

```
conversionLuminance
```

Format

This data frame contains the following columns:

cd.m.2 cd/m^2 = nit

cd.cm.2 cd/cm^2 = stilb

cd.ft.2 cd/ft^2

cd.in.2 cd/in^2

apostilb apostilb = blondel

millilambert millilambert

footlambert foot-lambert

Author(s)

Jose Gama

Source

J. Meyer-Arendt, "Radiometry and Photometry: Units and Conversion Factors," Appl. Opt. 7, 2081-2081 (1968).

References

J. Meyer-Arendt, "Radiometry and Photometry: Units and Conversion Factors," Appl. Opt. 7, 2081-2081 (1968).

Examples

```
data(conversionLuminance)
conversionLuminance
```

createIsoTempLinesTable *table of isotemperature lines for use with the Robertson Method*

Description

createIsoTempLinesTable table of isotemperature lines for use with the Robertson Method (Robertson, 1968) to interpolate isotemperature lines from the CIE 1960 UCS.

Usage

```
createIsoTempLinesTable(SPD=NA,CIETable = ciexyz31, TCS = TCSdata)
```

Arguments

SPD	light source spd
CIETable	reference data values
TCS	spectral reflectance data of 14 color test samples for CRI

Value

Iso temperature lines table

Author(s)

Jose Gama

Source

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

References

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

Examples

```
# illuminant A
SPD = illuminants[1:51*2-1,c('wlnm','A')] # every 10 nm
isoTempLinesTable <- createIsoTempLinesTable(SPD)
```

`daylightcomponents` *daylight components*

Description

`daylightcomponents` table with the mean relative spectral radiant power distribution and first two eigenvectors for the CIE method of calculating daylight.

Format

This data frame contains the following columns:

wlnm wavelength in nm

S0 mean relative spectral radiant power distribution

S1 first eigenvector

S2 second eigenvector

Author(s)

Jose Gama

Source

Wyszecki, G. and Stiles, W.S., 1982 Color Science: Concepts and Methods, Quantitative data and formulae. John Wiley & Sons.

References

Wyszecki, G. and Stiles, W.S., 1982 Color Science: Concepts and Methods, Quantitative data and formulae. John Wiley & Sons.

Examples

```
data(daylightcomponents)
str(daylightcomponents)
```

deltaE1976 *Delta E (CIE 1976)*

Description

deltaE1976 The color difference Delta E (CIE 1976).

Usage

```
deltaE1976(Lab1, Lab2)
```

Arguments

Lab1	CIE Lab color sample
Lab2	CIE Lab color reference

Value

Delta E

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

References

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

Examples

```
RGB1<-c(124,63,78)
RGB2<-c(95,213,184)
deltaE1976(RGB1,RGB2)
```

deltaE1994 *Delta E (CIE 1994)*

Description

deltaE1994 The color difference Delta E (CIE 1994).

Usage

```
deltaE1994(Lab1, Lab2, textiles = FALSE)
```

Arguments

Lab1	CIE Lab color sample
Lab2	CIE Lab color reference
textiles	boolean, TRUE = version for textiles

Value

Delta E

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

References

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

Examples

```
RGB1<-c(124,63,78)
RGB2<-c(95,213,184)
deltaE1994(RGB1,RGB2)
```

deltaE2000 *Delta E (CIE 2000)*

Description

deltaE2000 The color difference Delta E (CIE 2000).

Usage

```
deltaE2000(Lab1, Lab2)
```

Arguments

Lab1	CIE Lab color sample
Lab2	CIE Lab color reference

Value

Delta E

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

References

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

Examples

```
RGB1<-c(124,63,78)
RGB2<-c(95,213,184)
deltaE2000(RGB1,RGB2)
```

deltaECMC *Delta E CMC*

Description

deltaECMC The color difference method of the Color Measurement Committee (the CMC) .

Usage

```
deltaECMC(Lab1, Lab2, L, C)
```

Arguments

Lab1	CIE Lab color sample
Lab2	CIE Lab color reference
L	parameter L
C	parameter C

Value

Delta E

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

References

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

Examples

```
RGB1<-c(124,63,78)
RGB2<-c(95,213,184)
deltaECMC(RGB1,RGB2)
```

DIN6167.YellownessIndex *CIE Whiteness*

Description

DIN6167.YellownessIndex The CIE Whiteness index is widely used in the industry for D65 for 2 or 10 deg observer.

Usage

```
DIN6167.YellownessIndex(XYZmatrix, illuminant = "C", observer = 2, RefWhite
                = XYZperfectreflectingdiffuser)
```

Arguments

XYZmatrix	CIE values for illuminant C
illuminant	illuminant
observer	observer
RefWhite	Reference White

Author(s)

Jose Gama

Source

Scandinavian Pulp, paper and board, 2003 Basic equations for optical properties SCAN-G 5:03 Revised 2003

References

Scandinavian Pulp, paper and board, 2003 Basic equations for optical properties SCAN-G 5:03 Revised 2003

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
DIN6167.YellownessIndex(XYZ)
```

DIN99toCIELab *Conversion from DIN99 coordinates to CIELAB color space*

Description

DIN99toCIELab Conversion from DIN99 coordinates to CIELAB color space.

Usage

```
DIN99toCIELab(Lab99o)
```

Arguments

Lab99o	Lab99o coordinates

Value

CIELAB coordinates

Author(s)

Jose Gama

Source

DIN99 coordinates to CIELAB color space http://de.wikipedia.org/w/index.php?title=Diskussion:DIN99-Farbraum

References

DIN99 coordinates to CIELAB color space http://de.wikipedia.org/w/index.php?title=Diskussion:DIN99-Farbraum

Examples

```
DIN99toCIELab(c(0.59072, 0.85570, 0.80283))
```

dkl2dklCart *converts between spherical and cartesian coordinates for DKL*

Description

dkl2dklCart Converts DKL, from spherical coordinates to cartesian. dklCart2rgb Converts DKL, from cartesian to spherical coordinates.

Usage

```
dkl2dklCart(dklMatrix)
```

Arguments

dklMatrix	DKL coordinates

Value

DKL coordinates

Author(s)

Jose Gama

Source

Package psychopy for Python http://www.psychopy.org/epydoc/psychopy.misc-pysrc.html#dkl2dklCart

Graph-Based Visual Saliency (MATLAB source code) Jonathan Harel California Institute of Technology http://www.klab.caltech.edu/~harel/share/gbvs.php

References

Package psychopy for Python http://www.psychopy.org/epydoc/psychopy.misc-pysrc.html#dkl2dklCart

Graph-Based Visual Saliency (MATLAB source code) Jonathan Harel California Institute of Technology http://www.klab.caltech.edu/~harel/share/gbvs.php

Examples

```
RGB<-c(124,63,78)
d <- rgb2dklCart(RGB)
dklCart2dkl(d)
dkl2dklCart(c(1.647176, 60.8308, 91.45825))
d
```

dkl2rgb *convert RGB to DKL*

Description

dkl2rgb Converts DKL, spherical coords coordinates to sRGB. dklCart2rgb Converts DKL, cartesian coords coordinates to sRGB.

Usage

```
dkl2rgb(dklMatrix, conversionMatrix = NA)
```

Arguments

dklMatrix	DKL coordinates
conversionMatrix	conversion matrix

Value

RGB coordinates

Author(s)

Jose Gama

Source

Package psychopy for Python http://www.psychopy.org/epydoc/psychopy.misc-pysrc.html#dkl2rgb

Graph-Based Visual Saliency (MATLAB source code) Jonathan Harel California Institute of Technology http://www.klab.caltech.edu/~harel/share/gbvs.php

References

Package psychopy for Python http://www.psychopy.org/epydoc/psychopy.misc-pysrc.html#dkl2rgb

Graph-Based Visual Saliency (MATLAB source code) Jonathan Harel California Institute of Technology http://www.klab.caltech.edu/~harel/share/gbvs.php

Examples

```
dklC <- rgb2dklCart(c(54,75,121))
dklCart2dkl(dklC)
```

DominantWavelength *Convert CMY coordinates to CMYK*

Description

DominantWavelength Converts CMY coordinates to CMYK.

Usage

```
DominantWavelength(xyYmatrix, illuminant='D65',observer=2,
RefWhiteIllum=XYZperfectreflectingdiffuser)
```

Arguments

xyYmatrix	xyY matrix
illuminant	illuminant
observer	observer
RefWhiteIllum	Reference White

Value

Dominant Wavelength

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2013 http:#www.brucelindbloom.com/index.html?ColorCalculator.html

References

Bruce Justin Lindbloom, 2013 http:#www.brucelindbloom.com/index.html?ColorCalculator.html

Examples

```
DominantWavelength(c(0.59072, 0.85570, 0.80283))
```

`emittanceblackbodyPlanck` *emittance of a black body of temperature T at a given wavelength*

Description

`emittanceblackbodyPlanck` emittance of a black body of temperature T at a given wavelength (in metres).

Usage

```
emittanceblackbodyPlanck(wlnm, T)
```

Arguments

`wlnm`	wavelength in nm
`T`	temperature in Kelvin

Value

emittance

Author(s)

Jose Gama

Source

Planck's radiation law http://www.fourmich/documents/specrend/specrend.c

References

Planck's radiation law http://www.fourmich/documents/specrend/specrend.c

Examples

```
emittanceblackbodyPlanck(555,2000)
```

GanzGrieser.Tint *Ganz and Grieser Tint*

Description

GanzGrieser.Tint Ganz Grieser Tint Method.

Usage

```
GanzGrieser.Tint(xyYmatrix)
```

Arguments

xyYmatrix	CIE xyY values for illuminant C

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
GanzGrieser.Tint(xyY)
```

GanzGrieser.Whiteness *Ganz and Grieser Whiteness*

Description

GanzGrieser.Whiteness Dr. E. Ganz (formerly employee of Ciba AG, Switzerland) and Mr.R. Griesser (formerly employee of J.R.Geigy) developed the Ganz Grieser Whiteness Method.

Usage

```
GanzGrieser.Whiteness(xyYmatrix)
```

Arguments

xyYmatrix	CIE xyY values for illuminant C

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
GanzGrieser.Whiteness(xyY)
```

---

heuristic.wlnm2RGB *Approximations from wavelengths to RGB*

Description

heuristic.wlnm2RGB Approximations from wavelengths to RGB.

Usage

```
heuristic.wlnm2RGB(wavelength, Gamma = 0.8, IntensityMax = 1)
```

Arguments

wavelength	wavelenght data
Gamma	Gamma
IntensityMax	maximum intensity

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Dan Bruton's, 2004 www.physics.sfasu.edu/astro/color.html Earl F. Glynn 2006 Delphi conversion http://www.efg2.com/Lab/ScienceAndEngineering/Spectra.htm

References

Dan Bruton's, 2004 www.physics.sfasu.edu/astro/color.html Earl F. Glynn 2006 Delphi conversion http://www.efg2.com/Lab/ScienceAndEngineering/Spectra.htm

Examples

```
heuristic.wlnm2RGB(555)
```

HSL2RGB *Convert HSL coordinates to RGB*

Description

HSL2RGB Converts HSL coordinates to RGB.

Usage

```
HSL2RGB(HSLmatrix)
```

Arguments

HSLmatrix	HSL coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
HSL<-c(0.9590164, 0.3262032, 0.3666667)
HSL2RGB(HSL)
HSL2RGB(rbind(HSL,HSL,HSL,HSL,HSL))
```

HSV2RGB *Convert HSV coordinates to RGB*

Description

HSV2RGB Converts HSV coordinates to RGB.

Usage

```
HSV2RGB(HSVmatrix)
```

Arguments

HSVmatrix	HSV coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
HSV<-c(0.9590164, 0.4919355, 0.4862745)
HSV2RGB(HSV)
```

Hue.2.RGB *Convert Hue to RGB*

Description

Hue.2.RGB Converts Hue to RGB for HSL conversion.

Usage

```
Hue.2.RGB(v1, v2, vH)
```

Arguments

v1	value 1
v2	value 2
vH	value of hue

Value

RGB coordinates

Author(s)

Jose Gama

Source

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

References

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

Examples

```
Hue.2.RGB(1,2,3)
```

huedegree *convert Munsell hue to degree*

Description

huedegree convert Munsell hue to degree.

Usage

```
huedegree(MunIn)
```

Arguments

MunIn	Munsell hue color

Value

Munsell hue degree

Author(s)

Jose Gama

Source

Takahiro Onodera, 2010 Color-Model-Munsell-Util http://annocpan.org/dist/Color-Model-Munsell-Util

References

Takahiro Onodera, 2010 Color-Model-Munsell-Util http://annocpan.org/dist/Color-Model-Munsell-Util

Examples

```
huedegree('1P')
```

huedegreemunsell *Table with Munsell hue degrees*

Description

huedegreemunsell table with Munsell hue degrees.

Usage

```
huedegreemunsell
```

Format

This data frame contains the following columns:

HueDegree hue degree

HueMunsell hue in Munsell H

Author(s)

Jose Gama

Source

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

References

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

Examples

```
data(huedegreemunsell)
huedegreemunsell
```

Hunter60.WhitenessIndex

Hunter 60 Whiteness Index

Description

`Hunter60.WhitenessIndex` Hunter 60 Whiteness Index.

Usage

```
Hunter60.WhitenessIndex(LabHunterMatrix)
```

Arguments

LabHunterMatrix
: Lab Hunter values for illuminant C

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
HunterLab<-c(28.96756, 2.363884, 0.4821515)
Hunter60.WhitenessIndex(HunterLab)
```

HunterLab2XYZ *Convert HunterLab coordinates to XYZ*

Description

HunterLab2XYZ Converts HunterLab coordinates to XYZ.

Usage

```
HunterLab2XYZ(HunterLabmatrix, illuminant = "D65", observer = 2,
                RefWhite = XYZperfectreflectingdiffuser)
```

Arguments

HunterLabmatrix
: HunterLab coordinates

illuminant
: illuminant

observer
: observer

RefWhite
: Reference White

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
HunterLab2XYZ(c(0.310897, 0.306510, 74.613450))
```

---

illuminantA — *Relative spectral power distributions of CIE illuminant A at 1 nm interval*

Description

`illuminantA` is a table with Relative spectral power distributions of CIE illuminant A at 1 nm interval.

Usage

```
illuminantA
```

Format

This data frame contains the following data:

wlnm wavelength (nm)

intensity Relative spectral power

Author(s)

Jose Gama

Source

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

References

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

Examples

```
data(illuminantA)
illuminantA
```

`illuminantD65` *Relative spectral power distributions of CIE illuminant D65 at 1 nm interval*

Description

`illuminantD65` is a table with Relative spectral power distributions of CIE illuminant D65 at 1 nm interval.

Usage

```
illuminantD65
```

Format

This data frame contains the following data:

wlnm wavelength (nm)

intensity Relative spectral power

Author(s)

Jose Gama

Source

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

References

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

Examples

```
data(illuminantD65)
illuminantD65
```

`illuminants` *Relative spectral power distributions of CIE illuminants at 5 nm interval*

Description

`illuminants` is a table with Relative spectral power distributions of CIE illuminants at 5 nm interval.

Usage

```
illuminants
```

Format

This data frame contains the following data:

wlnm wavelength (nm)

A illuminant A

B illuminant B

C illuminant C

D50 illuminant D50

D55 illuminant D55

D65 illuminant D65

D75 illuminant D75

D93 illuminant D93

E illuminant E

Natural illuminant Natural

PlusWhite illuminant PlusWhite

TL84 illuminant TL84

Polylux3000 illuminant Polylux3000

Polylux4000 illuminant Polylux4000

KolorRite illuminant KolorRite

FL1 illuminant FL1

FL2 illuminant FL2

FL3 illuminant FL3

FL4 illuminant FL4

FL5 illuminant FL5

FL6 illuminant FL6

FL7 illuminant FL7

FL8 illuminant FL8

FL9 illuminant FL9

FL10 illuminant FL10

FL11 illuminant FL11

FL12 illuminant FL12

Author(s)

Jose Gama

Source

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

References

Wyszecki, G., & Stiles, W. S., 1982 Color Science: concepts and methods, quantitative data and formulae (2nd ed.). New York: Wiley.

Examples

```
data(illuminants)
illuminants
```

`ISObrightnessReflectometerRSD` *Weighting factors for the calculation of ISO brightness*

Description

`ISObrightnessReflectometerRSD` is a table with the weighting factors for the calculation of ISO brightness.

Usage

```
ISObrightnessReflectometerRSD
```

Format

This data frame contains the following data:

wln wavelength

F factor

weights weight

Author(s)

Jose Gama

Source

Scandinavian Pulp, paper and board, 2003 Basic equations for optical properties SCAN-G 5:03 Revised 2003

References

Scandinavian Pulp, paper and board, 2003 Basic equations for optical properties SCAN-G 5:03 Revised 2003

Examples

```
data(ISObrightnessReflectometerRSD)
ISObrightnessReflectometerRSD
```

---

kelvin2xy — *Blackbody radiator color temperature to CIE 1931 x,y chromaticity approximation function*

Description

`kelvin2xy` Blackbody radiator color temperature to CIE 1931 x,y chromaticity approximation function.

Usage

```
kelvin2xy(T)
```

Arguments

`T`	temperature in Kelvin

Value

color temperature

Author(s)

Jose Gama

Source

Kim et al., 2002 "Design of Advanced Color - Temperature Control System for HDTV Applications" http://fcam.garage.maemo.org/apiDocs/namespace_f_cam.html

References

Kim et al., 2002 "Design of Advanced Color - Temperature Control System for HDTV Applications" http://fcam.garage.maemo.org/apiDocs/namespace_f_cam.html

Examples

```
kelvin2xy(300)
```

Lab2LCHab *Convert CIE Lab coordinates to LCHab*

Description

Lab2LCHab Converts CIE Lab coordinates to LCHab.

Usage

```
Lab2LCHab(LabMatrix)
```

Arguments

LabMatrix	CIE Lab coordinates

Value

LCHab coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
Lab2LCHab(c(0.310897, 0.306510, 74.613450))
```

Lab2XYZ *Convert CIE Lab coordinates to XYZ*

Description

Lab2XYZ Converts CIE Lab coordinates to XYZ.

Usage

```
Lab2XYZ(Labmatrix, illuminant = "D65", observer = 2, RefWhite
                 = XYZperfectreflectingdiffuser)
```

Arguments

Labmatrix	CIE Lab coordinates
illuminant	illuminant
observer	observer
RefWhite	Reference White

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
Lab2XYZ(c(0.310897, 0.306510, 74.613450))
```

LCHab2Lab *Convert LCHab coordinates to CIE Lab*

Description

LCHab2Lab Converts LCHab coordinates to CIE Lab.

Usage

```
LCHab2Lab(LCHabmatrix)
```

Arguments

LCHabmatrix	LCHab coordinates

Value

CIE Lab coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
LCHab2Lab(c(0.310897, 0.306510, 74.613450))
```

LCHuv2Luv *Convert LCHuv coordinates to CIE Luv*

Description

LCHuv2Luv Converts LCHuv coordinates to CIE Luv.

Usage

```
LCHuv2Luv(LCHuvmatrix)
```

Arguments

LCHuvmatrix LCHuv coordinates

Value

CIE Luv coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
LCHuv2Luv(c(0.310897, 0.306510, 74.613450))
```

LEF2RGB *Convert LEF coordinates to RGB*

Description

LEF2RGB Converts LEF coordinates to RGB.

Usage

```
LEF2RGB(LEFmatrix)
```

Arguments

LEFmatrix LEF coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Kang, Henry R, 2006 Computational color technology Spie Press Bellingham

References

Kang, Henry R, 2006 Computational color technology Spie Press Bellingham

Examples

```
LEF<-c(176.66667, 53.50000, -12.99038)
LEF2RGB(LEF)
```

LMS2RGB *Convert LMS coordinates to RGB*

Description

LMS2RGB Converts LMS coordinates to RGB.

Usage

```
LMS2RGB(LMSmatrix)
```

Arguments

LMSmatrix	LMS coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

References

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

Examples

```
LMS<-c(3.822394, 10.17498, 1.130049)
LMS2RGB(LMS)
```

LMS2XYZ *Convert LMS coordinates to XYZ*

Description

LMS2XYZ Converts LMS coordinates to XYZ.

Usage

```
LMS2XYZ(LMSmatrix)
```

Arguments

LMSmatrix	LMS coordinates

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

References

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

Examples

```
LMS<-c(3.822394, 10.17498, 1.130049)
LMS2XYZ(LMS)
```

LSLM2RGB *Convert LSLM coordinates to RGB*

Description

LSLM2RGB Converts LSLM coordinates to RGB.

Usage

```
LSLM2RGB(LSLMmatrix)
```

Arguments

LSLMmatrix	LSLM coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

References

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

Examples

```
LSLM<-c(-0.4186083, 0.007563981, 0.4918533)
LSLM2RGB(LSLM)
```

Luv2LCHuv — *Convert CIE Luv coordinates to LCHuv*

Description

Luv2LCHuv Converts CIE Luv coordinates to LCHuv.

Usage

```
Luv2LCHuv(LuvMatrix)
```

Arguments

LuvMatrix	Luv coordinates

Value

LCHuv coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
Luv2LCHuv(c(0.310897, 0.306510, 74.613450))
```

Luv2XYZ — *Convert CIE Luv coordinates to XYZ*

Description

Luv2XYZ Converts CIE Luv coordinates to XYZ.

Usage

```
Luv2XYZ(Luvmatrix, illuminant = "D65", observer = 2, RefWhite
                = XYZperfectreflectingdiffuser)
```

Arguments

`Luvmatrix`	Luv matrix
`illuminant`	illuminant
`observer`	observer
`RefWhite`	Reference White

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
Luv2XYZ(c(0.310897, 0.306510, 74.613450))
```

`Luv2Yuv` *Convert CIE Luv coordinates to Yuv*

Description

`Luv2Yuv` Converts CIE Luv coordinates to Yuv.

Usage

```
Luv2Yuv(Luvmatrix,illuminant='D65',observer=2,RefWhite=XYZperfectreflectingdiffuser)
```

Arguments

`Luvmatrix`	CIE Luv coordinates
`illuminant`	illuminant
`observer`	observer
`RefWhite`	Reference White

Value

Yuv coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
Luv2Yuv(c(0.310897, 0.306510, 74.613450))
```

MaterialReferenceData *Material Reference Data from Principles of Digital Image Synthesis*

Description

MaterialReferenceData Material Reference Data from Principles of Digital Image Synthesis, Appendix G Andrew S. Glassner 16 August 1994.

Usage

```
MaterialReferenceData
```

Format

This data frame contains the following data:

wavelength wavelength (nm)

DarkSkin spectra of: dark skin

LightSkin spectra of: light skin

BlueSky spectra of: blue sky

Foliage spectra of: foliage

BlueFlower spectra of: blue flower

BluishGreen spectra of: bluish green

Orange spectra of: orange

PurplishBlue spectra of: purplish blue

ModerateRed spectra of: moderate red

Purple spectra of: purple

YellowGreen spectra of: yellow green

OrangeYellow spectra of: orange yellow

Blue spectra of: blue

Green spectra of: green

Red spectra of: red

Yellow spectra of: yellow

Magenta spectra of: magenta

Cyan spectra of: cyan

White spectra of: white

Neutral spectra of: neutral

Neutral6.5 spectra of: neutral 6.5

Neutral5 spectra of: neutral 5

Neutral3.5 spectra of: neutral 3.5

Black spectra of: black

PineNeedles spectra of: pine needles

SilverMapleLeaf spectra of: silver maple leaf

DarkGreenMapleLeaf spectra of: dark green maple leaf

RedMapleLeaf spectra of: red maple leaf

Grass spectra of: grass

Soil spectra of: soil

VineLeaf spectra of: vine leaf

Alphalt spectra of: alphalt

DaisyWhitePetals spectra of: daisy white petals

DaisyYellowCenter spectra of: daisy yellow center

MarigoldOrange spectra of: marigold orange

MarigoldYellow spectra of: marigold yellow

DarkBlueJeans spectra of: dark blue jeans

FadedJeans spectra of: faded jeans

DarkBlueSweatPants spectra of: dark blue sweat pants

Denim spectra of: denim

WheatBread spectra of: wheat bread

WheatBreadCrust spectra of: wheat bread crust

Pancake spectra of: pancake

SwissArmyKnife spectra of: swiss army knife

PineWood spectra of: pine wood

MapleWood spectra of: maple wood

OakWood spectra of: oak wood

Bamboo spectra of: bamboo

Redwood spectra of: redwood

WalnutWood spectra of: walnut wood

YellowBanana spectra of: yellow banana

RipeBrownBanana spectra of: ripe brown banana

Cucumber spectra of: cucumber

CornKernel spectra of: corn kernel

CornHusk spectra of: corn husk

YellowDeliciousApple spectra of: yellow delicious apple

GreenPepper spectra of: green pepper

LemonSkin spectra of: lemon skin

Lettuce spectra of: lettuce

Carrot spectra of: carrot

BarleySeeds spectra of: barley seeds

LentilSeeds spectra of: lentil seeds

BrownRiceSeeds spectra of: brown rice seeds

Sand spectra of: sand

Author(s)

Jose Gama

Source

Andrew S. Glassner, 1995 Principles of Digital Image Synthesis The Morgan Kaufmann Series in Computer Graphics and Geometric Modeling

References

Andrew S. Glassner, 1995 Principles of Digital Image Synthesis The Morgan Kaufmann Series in Computer Graphics and Geometric Modeling

Examples

```
data(MaterialReferenceData)
str(MaterialReferenceData)
```

MaxChromaFromExtrapRenotationData *Table with maximum chroma for which extrapolated renotation data is available*

Description

MaxChromaFromExtrapRenotationData table with maximum chroma for which extrapolated renotation data is available.

Usage

```
MaxChromaFromExtrapRenotationData
```

Format

This data frame contains the following columns:

H Hue

V Value

MaximumChroma Maximum Chroma

Author(s)

Jose Gama

Source

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

References

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

Examples

```
data(MaxChromaFromExtrapRenotationData)
MaxChromaFromExtrapRenotationData
```

`MaxChromasForStandardMunsellHuesAndValues`
Table with maximum Munsell chroma, for a given Munsell hue and value, for which an extrapolated renotation value is available

Description

`MaxChromasForStandardMunsellHuesAndValues` table with maximum Munsell chroma, for a given Munsell hue and value, for which an extrapolated renotation value is available.

Usage

```
MaxChromasForStandardMunsellHuesAndValues
```

Format

This data frame contains the following columns:

H Hue

V Value

MaximumChroma Maximum Chroma (MacAdam limit)

Author(s)

Jose Gama

Source

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

References

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

Examples

```
data(MaxChromasForStandardMunsellHuesAndValues)
MaxChromasForStandardMunsellHuesAndValues
```

`Munsell100hues55` *Chromaticity diagram showing values for x and y for Illuminant A for 100 hues at 5/5*

Description

`Munsell100hues55` Chromaticity diagram showing Tristimulus Values and Trilinear Coordinates for Illuminant A for 100 hues at 5/5.

Usage

```
Munsell100hues55
```

Format

This data frame contains the following columns:

BookNotation Munsell color notation from the Munsell book

MunsellProductionNo

X Tristimulus Value X

Y Tristimulus Value Y

Z Tristimulus Value Z

x Trilinear Coordinate x

y Trilinear Coordinate y

z Trilinear Coordinate z

Author(s)

Jose Gama

Source

Hermann VON Schelling, Dean Farnsworth, 1949 Trichromatic Specifications of the Munsell 100 Hues at 5/5 for Illuminant a Defense Technical Information Center NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN.

References

Hermann VON Schelling, Dean Farnsworth, 1949 Trichromatic Specifications of the Munsell 100 Hues at 5/5 for Illuminant a Defense Technical Information Center NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN.

Examples

```
data(Munsell100hues55)
Munsell100hues55
```

`Munsell100hues55FM100` *Munsell 100-Hues at 5/5, production numbers 101 to 200 and Farnsworth-Munsell 100 Hue test*

Description

`Munsell100hues55FM100` Munsell 100-Hues at 5/5, production numbers 101 to 200 and Farnsworth-Munsell 100 Hue test.

Usage

```
Munsell100hues55FM100
```

Format

This data frame contains the following columns:

FMtest Farnsworth-Munsell 100 Hue test value

MunsellNumber Munsell 100-Hues at 5/5, production number

Author(s)

Jose Gama

Source

Hermann VON Schelling, Dean Farnsworth, 1949 Trichromatic Specifications of the Munsell 100 Hues at 5/5 for Illuminant a Defense Technical Information Center NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN.

References

Hermann VON Schelling, Dean Farnsworth, 1949 Trichromatic Specifications of the Munsell 100 Hues at 5/5 for Illuminant a Defense Technical Information Center NAVAL MEDICAL RESEARCH LAB NEW LONDON CONN.

Examples

```
data(Munsell100hues55FM100)
Munsell100hues55FM100
```

MunsellHues *Table with Munsell Hues*

Description

MunsellHues table with Munsell Hues.

Usage

```
MunsellHues
```

Author(s)

Jose Gama

Source

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

References

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

Examples

```
data(MunsellHues)
MunsellHues
```

`MunsellNeutrals2sRGB` *Table with Munsell Neutrals and corresponding sRGB*

Description

`MunsellNeutrals2sRGB` table with Munsell Neutrals and corresponding sRGB.

Usage

```
MunsellNeutrals2sRGB
```

Format

This data frame contains the following columns:

MunsellNeutral Munsell N

R sRGB R

G sRGB G

B sRGB B

Author(s)

Jose Gama

Source

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

References

Paul Centore 2014 The Munsell and Kubelka-Munk Toolbox http://www.99main.com/~centore/MunsellAndKubelkaMunkToolbox/MunsellAndKubelkaMunkToolbox.html

James D. Foley, Andries van Dam, Steven K. Feiner, & John F. Hughes, 1990 Computer Graphics: Principles and Practice, 2nd ed., Addison-Wesley Publishing Company.

Gunter Wyszecki & W. S. Stiles, 1982 Color Science: Concepts and Methods, Quantitative Data and Formulae, 2nd edition, John Wiley and Sons

Examples

```
data(MunsellNeutrals2sRGB)
MunsellNeutrals2sRGB
```

MunsellSpectral *Table with Munsell spectral data*

Description

MunsellSpectral table for 1250 matt Munsell color chips with Munsell notation values, XYZ, xyY, RGB, CIE Lab, CIE Luv and spectral data.

Usage

```
MunsellSpectral
```

Author(s)

Jose Gama

Source

Spectral Color Research group, 1989 University of Kuopio, Finland School of Computing and the Department of Physics and Mathematics Database - Munsell Colors Matt (AOTF) http://cs.joensuu.fi/~spectral/databases/download/munsell_aotf.htm

Parkkinen, J. P. S., Hallikainen, J. and Jaaskelainen, 1989 "Characteristic spectra of Munsell colors," Journal of the Optical Society of America Vol. 6, No. 2, February 1989, pp. 318-322.

References

Spectral Color Research group, 1989 University of Kuopio, Finland School of Computing and the Department of Physics and Mathematics Database - Munsell Colors Matt (AOTF) http://cs.joensuu.fi/~spectral/databases/download/munsell_aotf.htm

Parkkinen, J. P. S., Hallikainen, J. and Jaaskelainen, 1989 "Characteristic spectra of Munsell colors," Journal of the Optical Society of America Vol. 6, No. 2, February 1989, pp. 318-322.

Examples

```
data(MunsellSpectral)
MunsellSpectral
```

`MunsellV2relativeLuminanceY` *Munsell value V to relative luminance Y*

Description

`MunsellV2relativeLuminanceY` Munsell value V to relative luminance Y.

Usage

```
MunsellV2relativeLuminanceY(V)
```

Arguments

`V`	Munsell value

Value

CIE XYZ "Y"

Author(s)

Jose Gama

Source

Mark D. Fairchild, 2013 Color Appearance Models, 3rd Ed. Wiley-IS&T

References

Mark D. Fairchild, 2013 Color Appearance Models, 3rd Ed. Wiley-IS&T

Examples

```
MunsellV2relativeLuminanceY(5)
```

MunsellV2Y *Munsell value to CIE XYZ "Y"*

Description

MunsellV2Y Munsell value to CIE XYZ "Y" .

Usage

```
MunsellV2Y(V)
```

Arguments

V	Munsell value

Value

CIE XYZ "Y"

Author(s)

Jose Gama

Source

ASTM, 2008 ASTM Standard D1535-08

References

ASTM, 2008 ASTM Standard D1535-08

Examples

```
MunsellV2Y(5)
```

NickersonColorDifference *Nickerson Color Difference*

Description

NickersonColorDifference Nickerson's Color Difference.

Usage

```
NickersonColorDifference(MunsellHVC1, MunsellHVC2)
```

Arguments

MunsellHVC1	Munsell HVC 1
MunsellHVC2	Munsell HVC 2

Value

Delta E

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

References

Bruce Justin Lindbloom, 2013 Color Calculator www.brucelindbloom.com

Examples

```
NickersonColorDifference('10B 5/6','5B 5/4')
```

PhotoYCC2RGB *Convert PhotoYCC to RGB*

Description

PhotoYCC2RGB Converts PhotoYCC to RGB.

Usage

```
PhotoYCC2RGB(PhotoYCCmatrix)
```

Arguments

PhotoYCCmatrix	PhotoYCC coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

References

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

Examples

```
p <- c(0.4560569, 155.9415709, 137.3026467)
PhotoYCC2RGB(p)
```

`PreucilAngle` *Preucil Angle*

Description

`PreucilAngle` Preucil Angle.

Usage

```
PreucilAngle(RGBmatrix)
```

Arguments

`RGBmatrix`	RGB coordinates

Value

Angle

Author(s)

Jose Gama

Source

Robert William Gainer Hunt, 1987 The Reproduction of Colour Fountain Press Edition 4, illustrated

References

Robert William Gainer Hunt, 1987 The Reproduction of Colour Fountain Press Edition 4, illustrated

Examples

```
PreucilAngle(c(24,72,44))
```

PreucilPercentGreyness *Preucil Percentage of Greyness*

Description

PreucilPercentGreyness Preucil Percentage of Greyness.

Usage

```
PreucilPercentGreyness(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

Percentage of Greyness

Author(s)

Jose Gama

Source

Robert William Gainer Hunt, 1987 The Reproduction of Colour Fountain Press Edition 4, illustrated

References

Robert William Gainer Hunt, 1987 The Reproduction of Colour Fountain Press Edition 4, illustrated

Examples

```
PreucilPercentGreyness(c(24,72,44))
```

PreucilPercentHueError *Preucil Percentage of Greyness*

Description

PreucilPercentHueError Preucil Percentage of Hue Error.

Usage

```
PreucilPercentHueError(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

Percentage of HueError

Author(s)

Jose Gama

Source

Robert William Gainer Hunt, 1987 The Reproduction of Colour Fountain Press Edition 4, illustrated

References

Robert William Gainer Hunt, 1987 The Reproduction of Colour Fountain Press Edition 4, illustrated

Examples

```
PreucilPercentHueError(c(24,72,44))
```

RGB2CMY *Convert sRGB coordinates to CMY*

Description

RGB2CMY Converts sRGB coordinates to CMY.

Usage

```
RGB2CMY(RGBmatrix)
```

Arguments

RGBmatrix	sRGB coordinates

Value

CMY coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
RGB2CMY(c(0.310897, 0.306510, 74.613450))
```

rgb2dklV *convert RGB to DKL*

Description

rgb2dklV Converts sRGB coordinates to DKL, spherical coords, sames as Graph-Based Visual Saliency. rgb2dklCart Converts sRGB coordinates to DKL, cartesian coords.

Usage

```
rgb2dklV(RGB)
```

Arguments

RGB	sRGB coordinates

Value

DKL coordinates

Author(s)

Jose Gama

Source

Package psychopy for Python http://www.psychopy.org/epydoc/psychopy.misc-pysrc.html#dkl2rgb

Graph-Based Visual Saliency (MATLAB source code) Jonathan Harel California Institute of Technology http://www.klab.caltech.edu/~harel/share/gbvs.php

References

Package psychopy for Python http://www.psychopy.org/epydoc/psychopy.misc-pysrc.html#dkl2rgb

Graph-Based Visual Saliency (MATLAB source code) Jonathan Harel California Institute of Technology http://www.klab.caltech.edu/~harel/share/gbvs.php

Examples

```
rgb2dklCart(c(54,75,121))
```

RGB2HSL *Convert RGB coordinates to HSL*

Description

RGB2HSL Converts RGB coordinates to HSL.

Usage

```
RGB2HSL(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

HSL coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
RGB<-c(124,63,78)
RGB2HSL(RGB)
```

RGB2HSV *Convert RGB coordinates to HSV*

Description

RGB2HSV Converts RGB coordinates to HSV.

Usage

```
RGB2HSV(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

HSV coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
RGB<-c(124,63,78)
RGB2HSV(RGB)
```

RGB2hue *Convert sRGB coordinates to hue*

Description

RGB2hue Converts sRGB coordinates to hue.

Usage

```
RGB2hue(RGBmatrix)
```

Arguments

RGBmatrix	sRGB coordinates

Value

hue

Author(s)

Jose Gama

Examples

```
RGB2hue(c(0.310897, 0.306510, 74.613450))
```

RGB2LEF *Convert RGB coordinates to LEF*

Description

RGB2LEF Converts RGB coordinates to LEF.

Usage

```
RGB2LEF(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

LEF coordinates

Author(s)

Jose Gama

Source

Kang, Henry R, 2006 Computational color technology Spie Press Bellingham

References

Kang, Henry R, 2006 Computational color technology Spie Press Bellingham

Examples

```
RGB<-c(124,63,78)
RGB2LEF(RGB)
```

RGB2LMS *Convert RGB coordinates to LMS*

Description

RGB2LMS Converts RGB coordinates to LMS.

Usage

```
RGB2LMS(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

LMS coordinates

Author(s)

Jose Gama

Source

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

References

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

Examples

```
RGB<-c(124,63,78)
RGB2LMS(RGB)
```

RGB2LSLM *Convert RGB coordinates to LSLM*

Description

RGB2LSLM Converts RGB coordinates to LSLM.

Usage

```
RGB2LSLM(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

LSLM coordinates

Author(s)

Jose Gama

Source

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

References

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

Examples

```
RGB<-c(124,63,78)
RGB2LSLM(RGB)
```

RGB2PhotoYCC *Convert RGB coordinates to PhotoYCC*

Description

RGB2PhotoYCC Converts RGB coordinates to PhotoYCC.

Usage

```
RGB2PhotoYCC(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

PhotoYCC coordinates

Author(s)

Jose Gama

Source

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

References

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

Examples

```
RGB<-c(124,63,78)
RGB2PhotoYCC(RGB)
```

RGB2XYZ *Convert sRGB coordinates to XYZ*

Description

RGB2XYZ Converts sRGB coordinates to XYZ.

Usage

```
RGB2XYZ(RGBmatrix, illuminant = "D65", observer = 2, RefWhite
                = XYZperfectreflectingdiffuser, RGBModel = "sRGB",
                RefWhiteRGB = whitepointsRGB, gamma = NA,
                RefWhiteIllum = XYZperfectreflectingdiffuser, CAT =
                "Bradford", CATarray = ChromaticAdaptation)
```

Arguments

RGBmatrix	sRGB coordinates
illuminant	illuminant
observer	observer
RefWhite	White Reference
RGBModel	RGB Model
RefWhiteRGB	White Reference RGB
gamma	gamma
RefWhiteIllum	White Reference illuminant
CAT	Chromatic Adaptation algorithm
CATarray	Chromatic Adaptation data

Value

CIE XYZ coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
RGB2XYZ(c(0.310897, 0.306510, 74.613450))
```

RGB2YCbCr *Convert RGB coordinates to YCbCr*

Description

RGB2YCbCr Converts RGB coordinates to YCbCr.

Usage

```
RGB2YCbCr(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

YCbCr coordinates

Author(s)

Jose Gama

Source

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

References

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

Examples

```
RGB<-c(124,63,78)
RGB2YCbCr(RGB)
```

RGB2YIQ *Convert RGB coordinates to YIQ*

Description

RGB2YIQ Converts RGB coordinates to YIQ.

Usage

```
RGB2YIQ(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

YIQ coordinates

Author(s)

Jose Gama

Source

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

References

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

Examples

```
RGB<-c(124,63,78)
RGB2YIQ(RGB)
```

RGB2YPbPr *Convert RGB coordinates to YPbPr*

Description

RGB2YPbPr Converts RGB coordinates to YPbPr.

Usage

```
RGB2YPbPr(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

YPbPr coordinates

Author(s)

Jose Gama

Source

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

References

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

Examples

```
RGB<-c(124,63,78)
RGB2YPbPr(RGB)
```

RGB2YUV *Convert RGB coordinates to YUV*

Description

RGB2YUV Converts RGB coordinates to YUV.

Usage

```
RGB2YUV(RGBmatrix)
```

Arguments

RGBmatrix	RGB coordinates

Value

YUV coordinates

Author(s)

Jose Gama

Source

Madk, Sophie Kirschner, 2014 Color space conversion http://www.blitzbasic.com/codearcs/codearcs.php?code=2953

References

Madk, Sophie Kirschner, 2014 Color space conversion http://www.blitzbasic.com/codearcs/codearcs.php?code=2953

Examples

```
RGB<-c(124,63,78)
RGB2YUV(RGB)
```

RxRyRz2XYZ *convert from three filter measurements (reflectance factors) to XYZ*

Description

RxRyRz2XYZ convert from three filter measurements (reflectance factors) to XYZ.

Usage

```
RxRyRz2XYZ(RxRyRzmatrix=NA,illuminant='C', observer=2,
RefWhite=XYZperfectreflectingdiffuser)
```

Arguments

RxRyRzmatrix	reflectance factors coordinates
illuminant	illuminant
observer	observer
RefWhite	White Reference

Value

CIE XYZ coordinates

Author(s)

Jose Gama

Examples

```
RxRyRz2XYZ(c(7.90393, 8.391198, 9.721126))
```

saturationCIECAM02 *saturation CIECAM 2002*

Description

saturationCIECAM02 saturation CIECAM 2002.

Usage

```
saturationCIECAM02(M, Q)
```

Arguments

M	colorfulness
Q	brightness

Value

saturation

Author(s)

Jose Gama

Source

Color by Wikipedians http://www.easyrgb.com/

References

Color by Wikipedians http://www.easyrgb.com/

`saturationCIELABEvaLubbe` *CIELAB saturation (Eva Lubbe)*

Description

`saturationCIELABEvaLubbe` CIELAB saturation (chroma normalized by lightness).

Usage

```
saturationCIELABEvaLubbe(L,a,b)
```

Arguments

L	CIELAB L
a	CIELAB a
b	CIELAB b

Value

saturation

Author(s)

Jose Gama

Source

Color by Wikipedians http://www.easyrgb.com/

References

Color by Wikipedians http://www.easyrgb.com/

Examples

```
saturationCIELABEvaLubbe(34.78467, 28.15159, 3.024663)
```

`saturationCIELUV` *CIELUV/CIELAB saturation*

Description

`saturationCIELUV` CIELUV/CIELAB saturation.

Usage

```
saturationCIELUV(u, v, un, vn)
```

Arguments

u	CIELAB u
v	CIELAB v
un	CIELAB u neutral
vn	CIELAB v neutral

Value

saturation

Author(s)

Jose Gama

Source

Color by Wikipedians http://www.easyrgb.com/

References

Color by Wikipedians http://www.easyrgb.com/

spectra2CCT *Correlated Color Temperature (CCT) from spectra*

Description

spectra2CCT Correlated Color Temperature (CCT) from spectra.

Usage

```
spectra2CCT(SPD=NA, isoTempLinesTable=NA,CIETable = ciexyz31, TCS = TCSdata)
```

Arguments

SPD	light source spd
isoTempLinesTable	Iso temperature lines table
CIETable	reference data values
TCS	spectral reflectance data of 14 color test samples for CRI

Value

Correlated Color Temperature (CCT)

Author(s)

Jose Gama

Source

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

References

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

Examples

```
# illuminant A
SPD = illuminants[1:51*2-1,c('wlnm','A')] # every 10 nm
CCT <- spectra2CCT(SPD)
CCT
```

`spectra2CRIGAIFSCI` *CRI, GAI and FSCI from spectra*

Description

`spectra2CRIGAIFSCI` Color Rendering Index (CRI), Gamut Area Index (GAI) and full spectrum index (FSCI) from spectra.

Usage

```
spectra2CRIGAIFSCI(SPD=NA, isoTempLinesTable=NA, CCT=NA,
CIETable = ciexyz31, TCS = TCSdata)
```

Arguments

`SPD`	light source spd
`isoTempLinesTable`	Iso temperature lines table
`CCT`	Correlated Color Temperature (CCT)
`CIETable`	reference data values
`TCS`	spectral reflectance data of 14 color test samples for CRI

Value

CRI, GAI and FSCI

Author(s)

Jose Gama

Source

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

References

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

Examples

```
# illuminant A
SPD = illuminants[1:51*2-1,c('wlnm','A')] # every 10 nm
isoTempLinesTable <- createIsoTempLinesTable(SPD)
CCT <- spectra2CCT(SPD)
spectra2CRIGAIFSCI(SPD, isoTempLinesTable, CCT)
spectra2CRIGAIFSCI(SPD, isoTempLinesTable)
spectra2CRIGAIFSCI(SPD)
```

---

spectra2ISObrightness *Diffuse blue reflectance factor (ISO brightness)*

Description

spectra2ISObrightness Diffuse blue reflectance factor (ISO brightness), R457, ISO 2470.

Usage

```
spectra2ISObrightness(spectraIn=NA, wlIn=NA, RSDmatrix=ISObrightnessReflectometerRSD)
```

Arguments

spectraIn	spectral data
wlIn	wavelength range
RSDmatrix	ISO brightness data

Value

LCHuv coordinates

Author(s)

Jose Gama

Source

ISO board, 2009 ISO 2470-1 : 2009 PAPER, BOARD AND PULPS MEASUREMENT OF DIFFUSE BLUE REFLECTANCE FACTOR PART 1 INDOOR DAYLIGHT CONDITIONS (ISO BRIGHTNESS)

References

ISO board, 2009 ISO 2470-1 : 2009 PAPER, BOARD AND PULPS MEASUREMENT OF DIFFUSE BLUE REFLECTANCE FACTOR PART 1 INDOOR DAYLIGHT CONDITIONS (ISO BRIGHTNESS)

Examples

```
spectra2ISObrightness(MaterialReferenceData[,c( 'BlueSky')],
MaterialReferenceData[,c('wavelength' )])
```

`spectra2lux` *Illuminance (Lux) from spectra*

Description

`spectra2lux` Illuminance (Lux) from spectra.

Usage

```
spectra2lux(spectraIn=NA, ciexyzIn=NA,wlIn=NA, wlInterval=NA)
```

Arguments

`spectraIn`	light source spd
`ciexyzIn`	reference data values
`wlIn`	range of output wavelengths
`wlInterval`	arbitrary wavelength interval to be applied to all series through interpolation

Value

Correlated Color Temperature (CCT)

Author(s)

Jose Gama

Source

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

References

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

Examples

```
spectra2lux(MaterialReferenceData[,c('wavelength','BlueSky')])
```

spectra2XYZ *convert spectral data to tristimulus values*

Description

spectra2XYZ convert spectral data to tristimulus values.

Usage

```
spectra2XYZ(spectraIn=NA, illuminantIn=NA, ciexyzIn=NA,wlIn=NA, wlInterval=NA)
```

Arguments

spectraIn	spectral data
illuminantIn	illuminant
ciexyzIn	range of illuminant wavelengths
wlIn	range of spectral wavelengths
wlInterval	arbitrary wavelength interval to be applied to all series through interpolation

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Andrew S. Glassner, 1995 Principles of digital image synthesis: Vol. 1 Kaufmann

References

Andrew S. Glassner, 1995 Principles of digital image synthesis: Vol. 1 Kaufmann

Examples

```
spectra2XYZ(MaterialReferenceData[,c('wavelength','BlueSky')])
```

sprague *Interpolates an n by w matrix of spectra, sprague*

Description

sprague Interpolates an n by w matrix of spectra, sprague.

Usage

```
sprague(spectra, f)
```

Arguments

spectra	spectral data
f	range of wavelenghts

Value

Interpolated spectral data

Author(s)

Jose Gama

Source

Stephen Westland, 2014 http://www.mathworks.com/matlabcentral/fileexchange/40640-computational-colour-s
content/sprague.m

References

Stephen Westland, 2014 http://www.mathworks.com/matlabcentral/fileexchange/40640-computational-colour-s
content/sprague.m

StearnsStearnscorrection *Stearns and Stearns correction*

Description

StearnsStearnscorrection Stearns and Stearns correction.

Usage

```
StearnsStearnscorrection(P)
```

Arguments

P	XYZ coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Stephen Westland and Caterina Ripamonti, 2004 Computational Colour Science using MATLAB John Wiley & Sons Ltd, pp.35

References

Stephen Westland and Caterina Ripamonti, 2004 Computational Colour Science using MATLAB John Wiley & Sons Ltd, pp.35

Stensby68.Whiteness *Stensby Whiteness*

Description

`Stensby68.Whiteness` formula was developed by Mr. P. Stensby (formerly employee of J.R. Geigy AG in US.)

Usage

```
Stensby68.Whiteness(LabHunterMatrix)
```

Arguments

LabHunterMatrix	Lab Hunter values for illuminant C

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
Stensby68.Whiteness(c(0.310897, 0.306510, 74.613450))
```

`Taube60.Whiteness` *Taube Whiteness*

Description

`Taube60.Whiteness` developed by Mr. Taube (formerly an employee of BASF AG, Germany). It was presented in 1960 and has found it's application mainly in the plastic sector.

Usage

```
Taube60.Whiteness(XYZmatrix, illuminant = "D65", observer = 2, RefWhite
                  = XYZperfectreflectingdiffuser)
```

Arguments

`XYZmatrix`	CIE tristimulus values for illuminant C
`illuminant`	illuminant
`observer`	observer
`RefWhite`	White reference

Author(s)

Jose Gama

Source

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

References

Xrite, 2012 Color iQC and Color iMatch Color Calculations Guide Version 8.0 30 July 2012 Revision 1.0

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
Taube60.Whiteness(XYZ)
```

TCSdata *The spectral reflectance data of 14 color test samples for CRI*

Description

TCSdata is a table with the spectral reflectance data of 14 color test samples for CRI.

Usage

```
TCSdata
```

Format

This data frame contains the following data:

wavelength wavelength (nm)

TCS1 spectral reflectance data for sample 1

TCS2 spectral reflectance data for sample 2

TCS3 spectral reflectance data for sample 3

TCS4 spectral reflectance data for sample 4

TCS5 spectral reflectance data for sample 5

TCS6 spectral reflectance data for sample 6

TCS7 spectral reflectance data for sample 7

TCS8 spectral reflectance data for sample 8

TCS9 spectral reflectance data for sample 9

TCS10 spectral reflectance data for sample 10

TCS11 spectral reflectance data for sample 11

TCS12 spectral reflectance data for sample 12

TCS13 spectral reflectance data for sample 13

TCS14 spectral reflectance data for sample 14

Author(s)

Jose Gama

Source

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

References

Rensselaer Polytechnic Institute Light Sources and Color Q & A Appendix B: MATLAB script for calculating measures of light source color: CCT, CRI, GA, and FSI http://www.lrc.rpi.edu/programs/nlpip/lightinganswers/lightsources/appendixb1.asp

Examples

```
data(TCSdata)
TCSdata
```

---

tristimulusMunsell *434 Munsell colors with tristimulus and CMFs for a few illuminants*

Description

`tristimulusMunsell` is a table with 434 Munsell colors with tristimulus and Color matching functions for illuminants A, C D and S.

Usage

```
tristimulusMunsell
```

Format

This data frame contains the following data:

Munsell Munsell color notation

X.A tristimulus X for illuminant A

Y.A tristimulus Y for illuminant A

Z.A tristimulus Z for illuminant A

x.A CMF x for illuminant A

y.A CMF y for illuminant A

X.C tristimulus X for illuminant C

Y.C tristimulus Y for illuminant C

Z.C tristimulus Z for illuminant C

x.C CMF x for illuminant C

y.C CMF y for illuminant C

X.D tristimulus X for illuminant D

Y.D tristimulus Y for illuminant D

Z.D tristimulus Z for illuminant D

x.D CMF x for illuminant D

y.D CMF y for illuminant D

X.S tristimulus for X illuminant S

Y.S tristimulus for Y illuminant S

Z.S tristimulus for Z illuminant S

x.S CMF x for illuminant S

y.S CMF y for illuminant S

X Munsell painting number

Author(s)

Jose Gama

Source

K. L. Kelley, K. S. Gibson, and D. Nickerson, 1943 "Tristimulus specification of the Munsell Book of Color from spectrophotometric measurements," J. Opt. Soc. Am. 33, 355–376

References

K. L. Kelley, K. S. Gibson, and D. Nickerson, 1943 "Tristimulus specification of the Munsell Book of Color from spectrophotometric measurements," J. Opt. Soc. Am. 33, 355–376

Examples

```
data(tristimulusMunsell)
tristimulusMunsell
```

WestlandBlacknessIndex

Westland, et al. blackness index

Description

`WestlandBlacknessIndex` (Westland, et al., 2006) blackness index.

Usage

```
WestlandBlacknessIndex(CIELabMatrix)
```

Arguments

`CIELabMatrix`	CIELab coordinates

Value

blackness index

Author(s)

Jose Gama

Source

Westland, S.; Cheung, T. L. V.; Lozman, O. R., 2006. A metric for predicting perceptual blackness. 14th Color Imaging Conference Final Program and Proceedings, 14-17.

References

Westland, S.; Cheung, T. L. V.; Lozman, O. R., 2006. A metric for predicting perceptual blackness. 14th Color Imaging Conference Final Program and Proceedings, 14-17.

Examples

```
CIELab<-c(34.78467, 28.15159, 3.024663)
WestlandBlacknessIndex(CIELab)
```

---

whitepointsilluminants

White points of standard illuminants

Description

`whitepointsilluminants` is a table with White points of standard illuminants.

Usage

```
whitepointsilluminants
```

Format

This data frame contains the following data:

illuminant illuminant

description description

x2 x2

y2 y2

x10 x10

y10 y10

CCT CCT

Author(s)

Jose Gama

Source

Wikipedia, 2014 White points of standard illuminants http://en.wikipedia.org/wiki/Standard_illuminant

References

Wikipedia, 2014 White points of standard illuminants http://en.wikipedia.org/wiki/Standard_illuminant

Examples

```
data(whitepointsilluminants)
whitepointsilluminants
```

---

whitepointsRGB *Primaries for RGB color spaces*

Description

whitepointsRGB is a table with primaries for RGB color spaces.

Usage

```
whitepointsRGB
```

Format

This data frame contains the following data:

xRed Primary red x

yRed Primary red y

xGreen Primary green x

yGreen Primary green y

xBlue Primary blue x

yBlue Primary blue y

whitepointilluminant illuminant

gamma gamma

description Color space name

Author(s)

Jose Gama

Source

Wikipedia, 2014 RGB color space http://en.wikipedia.org/wiki/RGB_color_space

References

Wikipedia, 2014 RGB color space http://en.wikipedia.org/wiki/RGB_color_space

Examples

```
data(whitepointsRGB)
whitepointsRGB
```

---

wlnm2XYZ *Approximates wavelength to CIE tristimulus XYZ*

Description

wlnm2XYZ Approximates wavelength to CIE tristimulus XYZ, by interpolation.

wlnm2xyz Approximates wavelength to CIE xyz, by interpolation.

Usage

```
wlnm2XYZ(wavelength)
```

Arguments

wavelength	wavelength

Value

CIE XYZ

Author(s)

Jose Gama

Examples

```
wlnm2XYZ(555)
```

xFit_1931 *Approximations from wavelengths to XYZ by Wyman et al*

Description

xFit_1931 Approximations from wavelengths to XYZ by Wyman et al.

Usage

```
xFit_1931(wave)
```

Arguments

wave	wavelenght data

Value

XYZ X, Y or Z coordinate

Author(s)

Jose Gama

Source

Chris Wyman Peter-Pike Sloan Peter Shirley, 2013 Simple Analytic Approximations to the CIE XYZ Color Matching Functions Journal of Computer Graphics Techniques Vol. 2, No. 2

References

Chris Wyman Peter-Pike Sloan Peter Shirley, 2013 Simple Analytic Approximations to the CIE XYZ Color Matching Functions Journal of Computer Graphics Techniques Vol. 2, No. 2

Examples

```
xFit_1931(555)
yFit_1931(555)
zFit_1931(555)
```

`xy2CCT.HernandezAndres` *convert from chromaticity coordinates to correlated color temperature (Hernandez Andres)*

Description

`xy2CCT.HernandezAndres` convert from chromaticity coordinates to correlated color temperature (approximation) by Hernandez Andres.

Usage

```
xy2CCT.HernandezAndres(x,y)
```

Arguments

x	x coordinates
y	y coordinates

Value

CCT (Hernandez Andres)

Author(s)

Jose Gama

Source

Hernandez-Andres, et al. 1999 "Calculating correlated color temperatures across the entire gamut of daylight and skylight chromaticities" http://en.wikipedia.org/wiki/Color_temperature

References

Hernandez-Andres, et al. 1999 "Calculating correlated color temperatures across the entire gamut of daylight and skylight chromaticities" http://en.wikipedia.org/wiki/Color_temperature

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
xy2CCT.HernandezAndres(xyY[1],xyY[2])
```

xy2CCT.McCamy *convert from chromaticity coordinates to correlated color temperature*

Description

xy2CCT.McCamy convert from chromaticity coordinates to correlated color temperature (approximation).

Usage

```
xy2CCT.McCamy(x,y)
```

Arguments

x	x coordinates
y	y coordinates

Value

CCT McCamy

Author(s)

Jose Gama

Source

C. S. McCamy, 1992 "Correlated color temperature as an explicit function of chromaticity coordinates" Color Research & Application Volume 17, Issue 2, pages 142–144

References

C. S. McCamy, 1992 "Correlated color temperature as an explicit function of chromaticity coordinates" Color Research & Application Volume 17, Issue 2, pages 142–144

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
xy2CCT.McCamy(xyY[1],xyY[2])
```

`xyChromaticitiesVos1978` *x, y coordinates transformed to Judd (1951) x', y' system*

Description

`xyChromaticitiesVos1978` x, y coordinates transformed to Judd (1951) x', y' system.

Usage

```
xyChromaticitiesVos1978(x,y)
```

Arguments

x	x coordinate
y	y coordinate

Value

x', y' coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
xyChromaticitiesVos1978(xyY[1],xyY[2])
```

xyY2XYZ *Convert CIE CMF to XYZ*

Description

xyY2XYZ Converts CIE CMF to XYZ.

Usage

```
xyY2XYZ(xyYmatrix)
```

Arguments

xyYmatrix	CIE CMFs

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

References

Logicol S.r.l., 2014 EasyRGB color search engine http://www.easyrgb.com/

Examples

```
xyY2XYZ(c(0.310897, 0.306510, 74.613450))
```

XYZ2BVR *convert from XYZ coordinates to BVR*

Description

XYZ2BVR convert from XYZ coordinates to BVR.

Usage

```
XYZ2BVR(XYZmatrix)
```

Arguments

XYZmatrix	XYZ coordinates

Value

BVR coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
XYZ2BVR(XYZ)
```

XYZ2CCT.Robertson *convert from chromaticity coordinates to correlated color temperature (Robertson)*

Description

XYZ2CCT.Robertson convert from chromaticity coordinates to correlated color temperature (approximation) by Robertson.

Usage

```
XYZ2CCT.Robertson(X, Y, Z)
```

Arguments

X	X coordinates
Y	Y coordinates
Z	Z coordinates

Value

CCT (Robertson)

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
XYZ2CCT.Robertson( 0.11465380, 0.08391198, 0.08222077 )
```

XYZ2HunterLab *convert from XYZ coordinates to Hunter Lab coordinates*

Description

XYZ2HunterLab convert from XYZ coordinates to Hunter Lab coordinates.

Usage

```
XYZ2HunterLab(XYZmatrix,illuminant='D65',observer=2,
RefWhite=XYZperfectreflectingdiffuser)
```

Arguments

XYZmatrix	XYZ coordinates
illuminant	illuminant
observer	observer
RefWhite	Reference White

Value

Hunter Lab coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
XYZ2HunterLab(XYZ)
```

XYZ2Lab *convert from XYZ coordinates to CIE Lab coordinates*

Description

XYZ2Lab convert from XYZ coordinates to CIE Lab coordinates.

Usage

```
XYZ2Lab(XYZmatrix,illuminant='D65',observer=2,RefWhite=XYZperfectreflectingdiffuser)
```

Arguments

XYZmatrix	XYZ coordinates
illuminant	illuminant
observer	observer
RefWhite	Reference White

Value

CIE Lab coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
CIELMatrix<-xyz2lab(XYZ*100)
```

XYZ2LMS *Convert XYZ coordinates to LMS*

Description

XYZ2LMS Converts XYZ coordinates to LMS.

Usage

```
XYZ2LMS(XYZmatrix)
```

Arguments

XYZmatrix	XYZ coordinates

Value

LMS coordinates

Author(s)

Jose Gama

Source

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

References

Francoise Vienot, Hans Brettel,John D. Mollon, 1999 Digital Video Colourmaps for Checking the Legibility of Displays by Dichromats Color Research & Application John Wiley & Sons, Inc.

Examples

```
XYZ<-c(21.43162, -3.20673, 120.6259)
XYZ2LMS(XYZ)
```

XYZ2Luv *convert from XYZ coordinates to CIE Luv coordinates*

Description

XYZ2Luv convert from XYZ coordinates to CIE Luv coordinates.

Usage

```
XYZ2Luv(XYZmatrix,illuminant='D65',observer=2,RefWhite=XYZperfectreflectingdiffuser)
```

Arguments

XYZmatrix	XYZ coordinates
illuminant	illuminant
observer	observer
RefWhite	Reference White

Value

CIE Luv coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
CIELuvMatrix<-xyz2luv(XYZ*100)
```

XYZ2RGB *convert from XYZ coordinates to CIE RGB coordinates*

Description

XYZ2RGB convert from XYZ coordinates to CIE RGB coordinates.

Usage

```
XYZ2RGB(XYZmatrix, illuminant = "D65", observer = 2, RefWhite
                = XYZperfectreflectingdiffuser, RGBModel = "sRGB",
                RefWhiteRGB = whitepointsRGB, gamma = NA,
                RefWhiteIllum = XYZperfectreflectingdiffuser, CAT =
                "Bradford", CATarray = ChromaticAdaptation)
```

Arguments

XYZmatrix	XYZ coordinates
illuminant	illuminant
observer	observer
RefWhite	Reference White
RGBModel	RGB model
RefWhiteRGB	Reference White point RGB
gamma	gamma
RefWhiteIllum	Reference White illuminant
CAT	CAT method
CATarray	Chromatic Adaptation

Value

CIE RGB coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
XYZ2RGB(XYZ)
```

XYZ2RxRyRz *convert from XYZ to three filter measurements (reflectance factors)*

Description

XYZ2RxRyRz convert from XYZ to three filter measurements (reflectance factors).

Usage

```
XYZ2RxRyRz(XYZmatrix=NA,illuminant='C', observer=2,
RefWhite=XYZperfectreflectingdiffuser)
```

Arguments

XYZmatrix	XYZ matrix
illuminant	illuminant
observer	observer
RefWhite	White Reference

Value

CIE XYZ coordinates

Author(s)

Jose Gama

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
XYZ2RxRyRz(XYZ)
```

XYZ2xyY *convert from XYZ coordinates to xyY coordinates*

Description

XYZ2xyY convert from XYZ coordinates to xyY coordinates.

Usage

```
XYZ2xyY(XYZmatrix,illuminant='D65',observer=2,RefWhite=XYZperfectreflectingdiffuser)
```

Arguments

XYZmatrix	XYZ coordinates
illuminant	illuminant
observer	observer
RefWhite	Reference White

Value

xyY coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
XYZ2xyY(XYZ)
```

XYZ2Yuv *convert from XYZ coordinates to Yuv coordinates*

Description

XYZ2Yuv convert from XYZ coordinates to Yuv coordinates.

Usage

```
XYZ2Yuv(XYZmatrix)
```

Arguments

XYZmatrix	XYZ coordinates

Value

Yuv coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
XYZ<-c(0.11465380, 0.08391198, 0.08222077)
XYZ2Yuv(XYZ)
```

XYZMoonSpencer1945 *Approximations from wavelengths to XYZ by Moon & Spencer*

Description

XYZMoonSpencer1945 Approximations from wavelengths to XYZ by Moon & Spencer.

Usage

```
XYZMoonSpencer1945(wavelen)
```

Arguments

wavelen	wavelenght data

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Chris Wyman Peter-Pike Sloan Peter Shirley, 2013 Simple Analytic Approximations to the CIE XYZ Color Matching Functions Journal of Computer Graphics Techniques Vol. 2, No. 2

References

Chris Wyman Peter-Pike Sloan Peter Shirley, 2013 Simple Analytic Approximations to the CIE XYZ Color Matching Functions Journal of Computer Graphics Techniques Vol. 2, No. 2

Examples

```
XYZMoonSpencer1945(555)
```

`XYZperfectreflectingdiffuser` *Perfect reflecting diffuser data*

Description

`XYZperfectreflectingdiffuser` table with perfect reflecting diffuser data.

Format

This data frame contains the following columns:

Illuminant Illuminant

X2 CIE tristimulus X 2 deg observer

Y2 CIE tristimulus Y 2 deg observer

Z2 CIE tristimulus Z 2 deg observer

X10 CIE tristimulus X 10 deg observer

Y10 CIE tristimulus Y 10 deg observer

Z10 CIE tristimulus Z 10 deg observer

Author(s)

Jose Gama

Source

Wyszecki, G. and Stiles, W.S., 1982 Color Science: Concepts and Methods, Quantitative data and formulae. John Wiley & Sons.

References

Wyszecki, G. and Stiles, W.S., 1982 Color Science: Concepts and Methods, Quantitative data and formulae. John Wiley & Sons.

Examples

```
data(XYZperfectreflectingdiffuser)
str(XYZperfectreflectingdiffuser)
```

XYZTannenbaum1974 *Approximations from wavelengths to XYZ by Tannenbaum 1974*

Description

XYZTannenbaum1974 Approximations from wavelengths to XYZ by Tannenbaum 1974.

Usage

```
XYZTannenbaum1974(wavelen)
```

Arguments

wavelen	wavelenght data

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Chris Wyman Peter-Pike Sloan Peter Shirley, 2013 Simple Analytic Approximations to the CIE XYZ Color Matching Functions Journal of Computer Graphics Techniques Vol. 2, No. 2

References

Chris Wyman Peter-Pike Sloan Peter Shirley, 2013 Simple Analytic Approximations to the CIE XYZ Color Matching Functions Journal of Computer Graphics Techniques Vol. 2, No. 2

Examples

```
XYZTannenbaum1974(555)
```

Y2MunsellV *CIE XYZ "Y" to Munsell value*

Description

Y2MunsellV CIE XYZ "Y" to Munsell value.

Usage

```
Y2MunsellV(Y)
```

Arguments

Y	Y data

Value

Munsell value

Author(s)

Jose Gama

Source

ASTM, 2008 ASTM Standard D1535-08

References

ASTM, 2008 ASTM Standard D1535-08

Examples

```
Y2MunsellV(5)
```

Y2MunsellVtable1D1535 *CIE XYZ "Y" to Munsell value formula, based on the ASTM Standard D1535-08*

Description

Y2MunsellVtable1D1535 NLSQ regression for obtaining similar results to table 1 from ASTM Standard D1535-08.

Usage

```
Y2MunsellVtable1D1535(Y)
```

Arguments

Y	Y data

Value

Munsell value

Author(s)

Jose Gama

Source

ASTM, 2008 ASTM Standard D1535-08

References

ASTM, 2008 ASTM Standard D1535-08

Examples

```
Y2MunsellVtable1D1535(5)
```

YCbCr2RGB *Convert YCbCr coordinates to RGB*

Description

YCbCr2RGB Converts YCbCr coordinates to RGB.

Usage

```
YCbCr2RGB(YPbPrmatrix)
```

Arguments

YPbPrmatrix	YPbPr coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

References

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

Examples

```
YCbCr2RGB(c(18165.831, -625.617, 6558.790))
```

YIQ2RGB *Convert YIQ coordinates to RGB*

Description

YIQ2RGB Converts YIQ coordinates to RGB.

Usage

```
YIQ2RGB(YIQmatrix)
```

Arguments

YIQmatrix	YIQ coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

References

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

Examples

```
YIQ2RGB(c(82.949, 31.51965, 17.58261))
```

YPbPr2RGB *Convert YCbCr coordinates to RGB*

Description

YPbPr2RGB Converts YCbCr coordinates to RGB.

Usage

```
YPbPr2RGB(YPbPrmatrix)
```

Arguments

YPbPrmatrix	YPbPr coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

References

Alex Izvorski, Copyright 2003-2005 (Portions Copyright 2001-2003 by Alfred Reibenschuh) Graphics/ColorObject version 0.5.0 http://www.poynton.com/notes/colour_and_gamma/ColorFAQ.txt

Examples

```
YPbPr2RGB(c(82.949000, -2.792896, 29.280320))
```

Yuv2Luv *Convert Yuv coordinates to Luv*

Description

Yuv2Luv Converts Yuv coordinates to Luv.

Usage

```
Yuv2Luv(Yu.v.matrix, illuminant = "D65", observer = 2,
                 RefWhite = XYZperfectreflectingdiffuser)
```

Arguments

Yu.v.matrix	Yuv matrix
illuminant	illuminant
observer	observer
RefWhite	Reference White

Value

Luv coordinates

Author(s)

Jose Gama

Source

Madk, Sophie Kirschner, 2014 Color space conversion http://www.blitzbasic.com/codearcs/codearcs.php?code=2953

References

Madk, Sophie Kirschner, 2014 Color space conversion http://www.blitzbasic.com/codearcs/codearcs.php?code=2953

Examples

```
Yuv <- c(0.08391198, 0.2830965, 0.4661789)
Yuv2Luv(Yuv)
```

YUV2RGB *Convert YUV coordinates to RGB*

Description

YUV2RGB Converts YUV coordinates to RGB.

Usage

```
YUV2RGB(YUVmatrix)
```

Arguments

YUVmatrix	YUV coordinates

Value

RGB coordinates

Author(s)

Jose Gama

Source

Madk, Sophie Kirschner, 2014 Color space conversion http://www.blitzbasic.com/codearcs/codearcs.php?code=2953

References

Madk, Sophie Kirschner, 2014 Color space conversion http://www.blitzbasic.com/codearcs/codearcs.php?code=2953

Examples

```
YUV2RGB(c(164.898, -5.584651, 58.53939))
```

Yuv2xy *convert from Yuv coordinates to xy coordinates*

Description

Yuv2xy convert from Yuv coordinates to xy coordinates.

Usage

```
Yuv2xy(Yu.v.matrix)
```

Arguments

Yu.v.matrix	Yuv coordinates

Value

xy coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
Yuv <- c(0.08391198, 0.2830965, 0.4661789)
Yuv2xy(Yuv)
```

Yuv2XYZ *convert from Yuv coordinates to XYZ coordinates*

Description

Yuv2XYZ convert from Yuv coordinates to XYZ coordinates.

Usage

```
Yuv2XYZ(Yu.v.matrix)
```

Arguments

Yu.v.matrix	Yuv coordinates

Value

XYZ coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
Yuv <- c(0.08391198, 0.2830965, 0.4661789)
Yuv2XYZ(Yuv)
```

Yxy2CIE1960UCS *convert from Yxy coordinates to CIE 1960 UCS*

Description

Yxy2CIE1960UCS convert from Yxy coordinates to CIE 1960 UCS.

Usage

```
Yxy2CIE1960UCS(Yxymatrix)
```

Arguments

Yxymatrix	Yxy coordinates

Value

CIE 1960 UCS

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
Yxy2CIE1960UCS(xyY[c(3,1,2)])
```

`Yxy2Yuv` *convert from Yxy coordinates to Yuv coordinates*

Description

`Yxy2Yuv` convert from Yxy coordinates to Yuv coordinates.

Usage

```
Yxy2Yuv(Yxymatrix)
```

Arguments

`Yxymatrix`	Yxy coordinates

Value

Yuv coordinates

Author(s)

Jose Gama

Source

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

References

Bruce Justin Lindbloom, 2014 http://www.brucelindbloom.com/index.html?Eqn_XYZ_to_T.html

Examples

```
xyY <- c(0.4083308, 0.2988462, 0.08391198)
Yxy2Yuv(xyY[c(3,1,2)])
```

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