Package ‘ggrisk’

February 9, 2020

Title  Risk Score Plot for Cox Regression

Version  1.0

Description  The risk plot may be one of the most commonly used figures in tumor genetic data analysis. We can conclude the following two points: Comparing the prediction results of the model with the real survival situation to see whether the survival rate of the high-risk group is lower than that of the low-level group, and whether the survival time of the high-risk group is shorter than that of the low-risk group. The other is to compare the heat map and scatter plot to see the correlation between the predictors and the outcome.

License  GPL-2

Encoding  UTF-8

LazyData  true

RoxygenNote  6.1.1

Depends  R (>= 2.10)

Imports  ggplot2, survival, egg, do, set, cutoff, fastStat, grid, rms, nomogramFormula

URL  https://github.com/yikeshu0611/ggrisk

BugReports  https://github.com/yikeshu0611/ggrisk/issues

NeedsCompilation  no

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Repository  CRAN

Date/Publication  2020-02-09 12:10:05 UTC

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Description

Risk Score Plot for Cox Regression

Usage

ggrisk(data, time, event, heatmap.genes, code.0 = "Alive", code.1 = "Dead", code.highrisk = "High", code.lowrisk = "Low", cutoff.show = TRUE, cutoff.value = "median", cutoff.x, cutoff.y, cutoff.label, title.A.ylab = "Risk Score", title.B.ylab = "Survival Time", title.A.legend = "Risk Group", title.B.legend = "Status", title.C.legend = "Expression", size.ABC = 1.5, size.ylab.title = 14, size.Atext = 11, size.Btext = 11, size.yticks = 0.5, size.yline = 0.5, size.points = 2, size.dashline = 1, size.cutoff = 5, size.legendtitle = 13, size.legendtext = 12, color.A = c(low = "blue", high = "red"), color.B = c(code.0 = "blue", code.1 = "red"), color.C = c(low = "blue", median = "white", high = "red"), vjust.A.ylab = 1, vjust.B.ylab = 2, family = "sans", expand.x = 3, relative_heights = c(0.1, 0.1, 0.01, 0.15))

Arguments

data dataframe data
time numeric variable. Name for following time
event must be numeric variable. Name for event, which must be coded as 0 and 1
heatmap.genes (optional) numeric variables. Name for genes
code.0 string. Code for event 0. Default is 'Alive'
code.1 string. Code for event 1. Default is 'Dead'
code.highrisk string. Code for highrisk in risk score. Default is 'High'
code.lowrisk string. Code for lowrisk in risk score. Default is 'Low'
cutoff.show logical, whether to show text for cutoff in figure A. Default is TRUE
cutoff.value string, which can be 'median', 'roc' or 'cutoff'. Even you can define it by yourself
cutoff.x numeric (optional), ordination x for cutoff text
cutoff.y numeric (optional), ordination y for cutoff text
cutoff.label (should be) string. Define cutoff label by yourself
title.A.ylab string, y-lab title for figure A. Default is 'Risk Score'
title.B.ylab string, y-lab title for figure B. Default is 'Survival Time'
title.A.legend string, legend title for figure A. Default is 'Risk Group'
title.B.legend string, legend title for figure B. Default is 'Status'
title.C.legend string, legend title for figure C. Default is 'Expression'
size.ABC numeric, size for ABC. Default is 1.5
size.ylab.title numeric, size for y-axis label title. Default is 14
size.Atext numeric, size for y-axis text in figure A. Default is 11
size.Btext numeric, size for y-axis text in figure B. Default is 11
size.Ctext numeric, size for y-axis text in figure C. Default is 11
size.yticks numeric, size for y-axis ticks. Default is 0.5
size.yline numeric, size for y-axis line. Default is 0.5
size.points numeric, size for scatter points. Default is 2
size.dashline numeric, size for dashline. Default is 1
size.cutoff numeric, size for cutoff text. Default is 5
size.legendtitle numeric, size for legend title. Default is 13
size.legendtext numeric, size for legend text. Default is 12
color.A color for figure A. Default is low = 'blue', high = 'red'
color.B color for figure B. Default is code.0 = 'blue', code.1 = 'red'
color.C color for figure C. Default is low = 'blue', median = 'white', high = 'red'
vjust.A.ylab numeric, vertical just for y-label in figure A. Default is 1
vjust.B.ylab numeric, vertical just for y-label in figure B. Default is 2
family family, default is sans
expand.x numeric, expand for x-axis
relative_heights numeric, relative heights for figure A, B, colored side bar and heatmap. Default is 0.1 0.1 0.01 and 0.15

Value

A risk score picture

Examples

ggrisk(data=LIRI, time='time', event='status',
       cutoff.value='median',
       cutoff.x = 145,
       cutoff.y = -0.8)

#more detailed example
library(ggrisk)
#plot
ggrisk(data=LIRI, time='time', event='status')

#heatmap.genes
ggrisk(data=LIRI, time='time', event='status', heatmap.genes=c('GPR182', 'CENPA', 'BCO2'))

#cutoff
ggrisk(data=LIRI, time='time', event='status', cutoff.value='median') #default
ggrisk(data=LIRI, time='time', event='status', cutoff.value='roc')
ggrisk(data=LIRI, time='time', event='status', cutoff.value='cutoff')
ggrisk(data=LIRI, time='time', event='status', cutoff.value=-1)
ggrisk(data=LIRI, time='time', event='status', cutoff.value='median', cutoff.x = 145, cutoff.y = -0.8)
ggrisk(data=LIRI, time='time', event='status', cutoff.value='median', cutoff.x = 145, cutoff.y = -0.8, cutoff.label='This is cutoff')

#code for 0 and 1
ggrisk(data=LIRI, time='time', event='status', cutoff.value='median', cutoff.x = 145, cutoff.y = -0.8, code.0 = 'Still Alive', code.1 = 'Already Dead')

#code for high and low risk group
ggrisk(data=LIRI, time='time', event='status', cutoff.value='median', cutoff.x = 145, cutoff.y = -0.8, code.0 = 'Still Alive', code.1 = 'Already Dead', code.highrisk = 'High Risk', code.lowrisk = 'Low Risk')

#title
ggrisk(data=LIRI, time='time', event='status', cutoff.value='median', cutoff.x = 145, cutoff.y = -0.8, code.0 = 'Still Alive', code.1 = 'Already Dead', code.highrisk = 'High Risk', code.lowrisk = 'Low Risk', title.A.ylab='Risk Score',
title.B.ylab='Survival Time(year)',
title.A.legend='Risk Group',
title.B.legend='Status',
title.C.legend='Expression')

#size

ggrisk(data=LIRI,time='time',event='status',
cutoff.value='median',
cutoff.x = 145,
cutoff.y = -0.8,
code.0 = 'Still Alive',
code.1 = 'Already Dead',
code.highrisk = 'High Risk',
code.lowrisk = 'Low Risk',
title.A.ylab='Risk Score',
title.B.ylab='Survival Time(year)',
title.A.legend='Risk Group',
title.B.legend='Status',
title.C.legend='Expression',
size.ABC=1.5,
size.ylab.title=14,
size.Atext=11,
size.Btext=11,
size.Ctext=11,
size.yticks=0.5,
size.yline=0.5,
size.points=2,
size.dashline=1,
size.cutoff=5,
size.legendtitle=13,
size.legendtext=12)

#color

ggrisk(data=LIRI,time='time',event='status',
cutoff.value='median',
cutoff.x = 145,
cutoff.y = -0.8,
code.0 = 'Still Alive',
code.1 = 'Already Dead',
code.highrisk = 'High Risk',
code.lowrisk = 'Low Risk',
title.A.ylab='Risk Score',
title.B.ylab='Survival Time(year)',
title.A.legend='Risk Group',
title.B.legend='Status',
title.C.legend='Expression',
size.ABC=1.5,
size.ylab.title=14,
size.Atext=11,
size.Btext=11,
size.Ctext=11,
size.yticks=0.5,
size.yline=0.5,
size.points=2,
size.dashline=1,
```r
size.cutoff=5,
size.legendtitle=13,
size.legendtext=12,
color.A=c(low='blue', high='red'),
color.B=c(code.0='blue', code.1='red'),
color.C=c(low='blue', median='white', high='red'))

#gjust
ggrisk(data=LIRI, time='time', event='status',
cutoff.value='median',
cutoff.x = 145,
cutoff.y = -0.8,
code.0 = 'Still Alive',
code.1 = 'Already Dead',
code.highrisk = 'High Risk',
code.lowrisk = 'Low Risk',
title.A.ylab='Risk Score',
title.B.ylab='Survival Time(year)',
title.A.legend='Risk Group',
title.B.legend='Status',
title.C.legend='Expression',
size.ABC=1.5,
size.ylab.title=14,
size.Atext=11,
size.Btext=11,
size.Ctext=11,
size.yticks=0.5,
size.yline=0.5,
size.points=2,
size.dashline=1,
size.cutoff=5,
size.legendtitle=13,
size.legendtext=12,
color.A=c(low='blue', high='red'),
color.B=c(code.0='blue', code.1='red'),
color.C=c(low='blue', median='white', high='red'),
vjust.A.ylab=1,
vjust.B.ylab=2)
```

#family, expand, relative height
ggrisk(data=LIRI, time='time', event='status',
cutoff.value='median',
cutoff.x = 145,
cutoff.y = -0.8,
code.0 = 'Still Alive',
code.1 = 'Already Dead',
code.highrisk = 'High Risk',
code.lowrisk = 'Low Risk',
title.A.ylab='Risk Score',
title.B.ylab='Survival Time(year)',
title.A.legend='Risk Group',
title.B.legend='Status',
title.C.legend='Expression',
```
LIRI

ICGC Liver Data from Japan

Description

This data is a liver cancer data from Japan Data released in ICGC database (Link). It contains time, event and four genes.

Usage

data(LIRI)

Format

An object of class data.frame with 232 rows and 6 columns.

Examples

data(LIRI)
two_scatter

Two Scatter Plot Plot for Cox Regression

Description

Two Scatter Plot Plot for Cox Regression

Usage

two_scatter(data, time, event, code.0 = "Alive", code.1 = "Dead",
code.highrisk = "High", code.lowrisk = "Low", cutoff.show = TRUE,
cutoff.value = "median", cutoff.x, cutoff.y, cutoff.label,
title.xlab = "Rank", title.A.legend = "Risk Group",
title.B.legend = "Status", size.AB = 1.5, size.ylab.title = 14,
size.xlab.title = 14, size.Atext = 11, size.Btext = 11,
size.xtext = 11, size.ytext = 0.5, size.yline = 0.5,
size.points = 2, size.dashline = 1, size.cutoff = 5,
size.legendtitle = 13, size.legendtext = 12, color.A = c(low =
"blue", high = "red"), color.B = c(code.0 = "blue", code.1 = "red"),
vjust.A.ylab = 1, vjust.B.ylab = 2, family = "sans",
expand.x = 3)

Arguments

data dataframe data
time numeric variable. Name for following time
event must be numeric variable. Name for event, which must be coded as 0 and 1
code.0 string. Code for event 0. Default is 'Alive'
code.1 string. Code for event 1. Default is 'Dead'
code.highrisk string. Code for highrisk in risk score. Default is 'High'
code.lowrisk string. Code for lowrisk in risk score. Default is 'Low'
cutoff.show logical, whether to show text for cutoff in figure A. Default is TRUE
cutoff.value string, which can be 'median', 'roc' or 'cutoff'. Even you can define it by yourself
cutoff.x numeric (optional), ordination x for cutoff text
cutoff.y numeric (optional), ordination y for cutoff text
cutoff.label (should be) string. Define cutoff label by yourself
title.A.ylab string, y-lab title for figure A. Default is 'Riskscore'
title.B.ylab string, y-lab title for figure B. Default is 'Survival Time'
title.xlab string, x-lab title for figure B. Default is 'Rank'
title.A.legend string, legend title for figure A. Default is 'Risk Group'
two_scatter

title.B.legend  string, legend title for figure B. Default is 'Status'
size.AB       numeric, size for ABC. Default is 1.5
size.ylab.title   numeric, size for y-axis label title. Default is 14
size.xlab.title   numeric, size for x-axis lab title. Default is 11
size.Atext       numeric, size for y-axis text in figure A. Default is 11
size.Btext       numeric, size for y-axis text in figure B. Default is 11
size.xtext       numeric, size for x-axis text. Default is 11
size.xyticks     numeric, size for y-axis ticks. Default is 0.5
size.xyline      numeric, size for y-axis line. Default is 0.5
size.points      numeric, size for scatter points. Default is 2
size.dashline    numeric, size for dashline. Default is 1
size.cutoff      numeric, size for cutoff text. Default is 5
size.legenda.title  numeric, size for legend title. Default is 13
size.legendtext   numeric, size for legend text. Default is 12
color.A          color for figure A. Default is low = 'blue', high = 'red'
color.B          color for figure B. Default is code.0 = 'blue', code.1 = 'red'
vjust.A.ylab     numeric, vertical just for y-label in figure A. Default is 1
vjust.B.ylab     numeric, vertical just for y-label in figure B. Default is 2
family           family, default is sans
expand.x         numeric, expand for x-axis

Value
A riskscore picture

Examples

two_scatter(data=LIRI,time='time',event='status',
cutoff.value = 'median',
cutoff.x = 142,
cutoff.y = -0.5)

#more detailed example
library(ggrisk)
plot
two_scatter(data=LIRI,time='time',event='status')
#regulate cutoff
#hidden cutoff
two_scatter(data=LIRI,time='time',event='status',
cutoff.show = FALSE)
two_scatter(data=LIRI,time='time',event='status',

two_scatter(value = 'median')
two_scatter(data=LIRI, time='time', event='status',
cutoff.value = 'roc')
two_scatter(data=LIRI, time='time', event='status',
cutoff.value = 'cutoff')
two_scatter(data=LIRI, time='time', event='status',
cutoff.value = -1)
two_scatter(data=LIRI, time='time', event='status',
cutoff.value = 'median',
cutoff.x = 142,
cutoff.y = -0.5)
#code for 0 and 1
two_scatter(data=LIRI, time='time', event='status',
cutoff.value = 'median',
cutoff.x = 142,
cutoff.y = -0.5,
code.0 = 'Still Alive',
code.1 = 'Dead')
#code for high and low risk group
two_scatter(data=LIRI, time='time', event='status',
cutoff.value = 'median',
cutoff.x = 142,
cutoff.y = -0.5,
code.0 = 'Still Alive',
code.1 = 'Dead',
code.highrisk = 'High Group',
code.lowrisk = 'Low Group')
#title for legend, x and y lab
two_scatter(data=LIRI, time='time', event='status',
cutoff.value = 'median',
cutoff.x = 142,
cutoff.y = -0.5,
code.0 = 'Still Alive',
code.1 = 'Dead',
code.highrisk = 'High Group',
code.lowrisk = 'Low Group',
title.A.legend = 'Riskscore',
title.B.legend = 'Event Status',
title.A.ylab = 'Riskscore',
title.B.ylab = 'Survival Time(year)',
title.xlab = 'This is rank')
#vertical just for y-axis lab
two_scatter(data=LIRI, time='time', event='status',
cutoff.value = 'median',
cutoff.x = 142,
cutoff.y = -0.5,
code.0 = 'Still Alive',
code.1 = 'Dead',
code.highrisk = 'High Group',
code.lowrisk = 'Low Group',
title.A.legend = 'Riskscore',
title.B.legend = 'Event Status',
title.A.ylab = 'Riskscore',
title.B.ylab = 'Survival Time(year)',
title.xlab = 'This is rank')
two_scatter

title.B.ylab = 'Survival Time(year)',
title.xlab = 'This is rank',
vjust.A.ylab = 1,
vjust.B.ylab = 3)

#size
two_scatter(data=LIRI,time='time',event='status',
cutoff.value = 'median',
cutoff.x = 142,
cutoff.y = -0.5,
code.0 = 'Still Alive',
code.1 = 'Dead',
code.highrisk = 'High Group',
code.lowrisk = 'Low Group',
title.A.legend = 'Riskscore',
title.B.legend = 'Event Status',
title.A.ylab = 'Riskscore',
title.B.ylab = 'Survival Time(year)',
title.xlab = 'This is rank',
vjust.A.ylab = 1,
vjust.B.ylab = 3,
size.AB = 2,
size.ylab.title = 14,
size.xlab.title = 14,
size.Atext = 12,
size.Btext = 12,
size.xtext = 12,
size.xyticks = 0.5,
size.xyline = 0.5,
size.dashline = 1.5,
size.points = 1,
size.cutoff = 5,
size.legendtitle = 14,
size.legendtext = 13)

#color
two_scatter(data=LIRI,time='time',event='status',
cutoff.value = 'median',
cutoff.x = 142,
cutoff.y = -0.5,
code.0 = 'Still Alive',
code.1 = 'Dead',
code.highrisk = 'High Group',
code.lowrisk = 'Low Group',
title.A.legend = 'Riskscore',
title.B.legend = 'Event Status',
title.A.ylab = 'Riskscore',
title.B.ylab = 'Survival Time(year)',
title.xlab = 'This is rank',
vjust.A.ylab = 1,
vjust.B.ylab = 3,
size.AB = 2,
size.ylab.title = 14,
size.xlab.title = 14,
size.Atext = 12,
size.Btext = 12,
size.xtext = 12,
size.xyticks = 0.5,
size.xyline = 0.5,
size.dashline = 1.5,
size.points = 1,
size.cutoff = 5,
size.legendtitle = 14,
size.legendtext = 13,
color.A = c(low='green',high='red'),
color.B = c(code.0='green',code.1='red'))

#famli and expand
two_scatter(data=LIRI,time='time',event='status',
cutoff.value = 'median',
cutoff.x = 142,
cutoff.y = -0.5,
code.0 = 'Still Alive',
code.1 = 'Dead',
code.highrisk = 'High Group',
code.lowrisk = 'Low Group',
title.A.legend = 'Riskscore',
title.B.legend = 'Event Status',
title.A.ylab = 'Riskscore',
title.B.ylab = 'Survival Time(year)',
title.xlab = 'This is rank',
vjust.A.ylab = 1,
vjust.B.ylab = 3,
size.AB = 2,
size.ylab.title = 14,
size.xlab.title = 14,
size.Atext = 12,
size.Btext = 12,
size.xtext = 12,
size.xyticks = 0.5,
size.xyline = 0.5,
size.dashline = 1.5,
size.points = 1,
size.cutoff = 5,
size.legendtitle = 14,
size.legendtext = 13,
color.A = c(low='green',high='red'),
color.B = c(code.0='green',code.1='red'),
family = 'sans', # sans for Arail, serif for Times New Roman
expand.x=10)
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