Package ‘plotGMM’

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Type Package

Title Tools for Visualizing Gaussian Mixture Models

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Description The main function, plot_GMM, is used for plotting output from Gaussian mixture models (GMMs), including both densities and overlaying mixture weight component curves from the fit GMM. The package also include the function, plot_cut_point, which plots the cut-point (mu) from the GMM over a histogram of the distribution with several color options. Finally, the package includes the function, plot_mix_comps, which is used in the plot_GMM function, and can be used to create a custom plot for overlaying mixture component curves from GMMs. For the plot_mix_comps function, usage most often will be specifying the `fun` argument within `stat_function` in a ggplot2 object.

Imports methods, wesanderson, amerika, ggplot2

Suggests mixtools, testthat, graphics

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plot_cut_point  Plots Cut Point from Gaussian Mixture Models

Description

Returns a plot of the data density (histogram) with an overlaid cut point generated by a Gaussian mixture model.

Usage

plot_cut_point(m, plot = TRUE, color = c("grayscale", "amerika", "wesanderson"))

Arguments

m  An object of class mixEM corresponding with the fit GMM
plot  A logical argument for generating the plot. If FALSE, only the cut point value from the GMM is returned. If TRUE, histogram with the overlaid cut point is returned. Default is set to TRUE.
color  A vector of color options including "amerika" (from package amerika), "wesanderson" (from package wesanderson), and "grayscale", which is the default option.

Details

Gaussian mixture models are often used to derive cut points, or lines of separation between clusters in feature space (See Benaglia et al. 2009 for more). The plot_cut_point function plots data densities with the overlaid cut point (the mean of the calculated mu) from mixEM objects, which are GMM’s fit using the mixtools package.

References


Examples
mixmdl <- mixtools::normalmixEM(faithful$waiting, k = 2)
plot_cut_point(mixmdl, plot = TRUE, color = "amerika")  # returns plot, amerika
plot_cut_point(mixmdl, plot = TRUE, color = "wesanderson")  # returns plot, wesanderson
plot_cut_point(mixmdl, plot = FALSE)  # returns only the cut point value from the GMM

plot_GMM
Plots Mixture Components from Gaussian Mixture Models

Description
Generates a plot of data densities with overlaid mixture components from a Gaussian mixture model (GMM)

Usage
plot_GMM(m, k=NULL)

Arguments
m An object of class mixEM corresponding with the fit GMM
k The number of components specified in the GMM, m

Details
Uses ggplot2 graphics to plot data densities with overlaid components from mixEM objects, which are GMM's fit using the mixtools package.
Note: Users must enter the same component value, k, in the plot_GMM function, as that which was specified in the original GMM specification (also k in mixtools).

References

Examples
set.seed(235)
mixmdl <- mixtools::normalmixEM(faithful$waiting, k = 2)
plot_GMM(mixmdl, 2)
plot_mix_comps

Custom Function for Overlaying Mixture Components

Description
Plots a mixture component conditioned on a superimposed function

Usage
plot_mix_comps(x, mu, sigma, lam)

Arguments
- **x**: Input data
- **mu**: Mean of component
- **sigma**: Variance of component
- **lam**: Mixture weight of component

Details
Allows for specifying a custom function to be superimposed when plotting a mixture component

Examples
```r
set.seed(1)
mixmdl <- mixtools::normalmixEM(faithful$waiting, k = 2)
x <- mixmdl$x
x <- data.frame(x)
ggplot2::ggplot(data.frame(x)) +
ggplot2::geom_density(ggplot2::aes(x), color="black", fill="black") +
ggplot2::stat_function(geom = "line", fun = plot_mix_comps,
  args = list(mixmdl$mu[1], mixmdl$sigma[1], lam = mixmdl$lambda[1]),
  colour = "red") +
ggplot2::stat_function(geom = "line", fun = plot_mix_comps,
  args = list(mixmdl$mu[2], mixmdl$sigma[2], lam = mixmdl$lambda[2]),
  colour = "blue")
```
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