Package ‘plotmm’

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**Type** Package

**Title** Tidy Tools for Visualizing Mixture Models

**Version** 0.1.0

**BugReports** https://github.com/pdwaggoner/plotmm/issues

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**Description** The main function, `plot_mm()`, is used for plotting output from mixture models, including both densities and overlaying mixture weight component curves from the fit models. In line with the tidyverse, the package also includes the `plot_cut_point()` function to visualize the cut-point (mu) from the model over a histogram of the data density with several color options. Finally, the package includes the `plot_mix_comps()` helper function, which is used for both added customization as well as in the `plot_mm()` function. Supported model objects include: ‘mixtools’, ‘EMCluster’, and ‘flexmix’, with more from each forthcoming. Supported mixture model specifications include mixtures of univariate Gaussians, multivariate Gaussians, Gammas, logistic regressions, linear regressions, and Poisson regressions.

**Imports** methods, wesanderson, amerika, ggplot2, dplyr, patchwork

**Suggests** mixtools, EMCluster, flexmix, testthat, graphics

**License** MIT + file LICENSE

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 6.1.1

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plot_cut_point Tidy Visualization of a Cut Point from a Mixture Model

Description

Returns a plot of the data density (histogram) with an overlaid cut point generated by the fit 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 mixture model
plot Logical 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 amerika package), "wesanderson" (from wesanderson package), and "grayscale", which is the default option.

Details

Mixture models can be used to derive cut points separating clusters via soft assignment (See Benaglia et al. 2009 for more). plot_cut_point() plots data density with an overlaid cut point (the mean of the calculated mu) from mixEM objects via mixtools.

References


Examples

if(require(mixtools)){
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

Original function from the plotGMM package. Retained here for bridging between the packages. We recommend using instead the updated plot_mm function.

Note: plot_gmm requires a mixtools object to be supplied. 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

if(require(mixtools)){
mixmdl <- mixtools::normalmixEM(faithful$waiting, k = 2)
}
plot_gmm(mixmdl, 2)
plot_mix_comps

Helper Function for Overlaying Mixture Components

Description

Allows for plotting mixture components conditioned on a superimposed function meant for passage to ggplot’s stat_function()

Usage

plot_mix_comps(x, mu = NULL, sigma = NULL, lam = 1, beta0 = NULL,
      beta1=NULL, alpha=NULL, beta=NULL,
      normal=FALSE, logisreg=FALSE,
      gamma=FALSE, poisson=FALSE)

Arguments

x Input data
mu Component mean
sigma Component variance
lam Component mixture weight
beta0 Coefficient values
beta1 Coefficient values
alpha Initial shape parameters
beta Initial parameter values
normal Logical for normal distribution
logisreg Logical for logistic regression mixtures
gamma Logical for gamma distribution
poisson Logical for poisson regression mixtures

Details

Allows for component curves to be superimposed over a mixture model plot

Examples

if(require(mixtools)){
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]),
Custom Function for Overlaying Mixture Components for Normal Distributions

Description

Plots a mixture component conditioned on a superimposed function

Usage

plot_mix_comps_normal(x, mu, sigma, lam)

Arguments

x
mu
sigma
lam
Input data
Mean of component
Variance of component
Mixture weight of component

Details

Allows for specifying a custom function to be superimposed when plotting a mixture component assuming a normal distribution. This is the original function for the package, which is also included in the updated plot_mix_comps() function.

Examples

if(require(mixtools)){
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_normal,
    args = list(mixmdl$mu[1], mixmdl$sigma[1], lam = mixmdl$lambda[1]),
    colour = "red") +
ggplot2::stat_function(geom = "line", fun = plot_mix_comps_normal,
    args = list(mixmdl$mu[2], mixmdl$sigma[2], lam = mixmdl$lambda[2]),
    colour = "blue")
Description
Generates a ggplot of data densities with overlaid mixture components from fit mixture models.

Usage
plot_mm(m, k = NULL, data = NULL)

Arguments
m A mixture model object
k Optional. The number of components specified in the mixture model, m
data Name of data object required only for EMCluster objects

Details
This is the core function in the package, returning a ggplot object for a fit mixture model. The plot includes the data density with overlaid mixture components.

References

Examples

if(require(mixtools)){
  mixmdl1 <- mixtools::normalmixEM(faithful$waiting, k = 2)
}
plot_mm(mixmdl1, 2)

if(require(mixtools)){
x <- c(rgamma(200, shape = 50, scale = 11), rgamma(200, shape = 28, scale = 6))
mixmdl2 <- mixtools::gammaxmixEM(x, lambda = c(1, 1)/2)
}
plot_mm(mixmdl2)
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