

# Package: plotGMM (via r-universe)

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**Type** Package

**Title** Tools for Visualizing Gaussian Mixture Models

**Version** 0.2.2

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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 cutpoint ( $\mu$ ) 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

**License** MIT + file LICENSE

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**NeedsCompilation** no

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## Contents

plot_cut_point . . . . .	2
plot_GMM . . . . .	3
plot_mix_comps . . . . .	4
<b>Index</b>	<b>5</b>

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plot_cut_point	<i>Plots Cut Point from Gaussian Mixture Models</i>
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### 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 <code>mixEM</code> corresponding with the fit GMM
plot	A logical argument for generating the plot. If <code>FALSE</code> , only the cut point value from the GMM is returned. If <code>TRUE</code> , histogram with the overlaid cut point is returned. Default is set to <code>TRUE</code> .
color	A vector of color options including "amerika" (from package <code>amerika</code> ), "wesanderson" (from package <code>wesanderson</code> ), 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

Benaglia, T., Chauveau, D., Hunter, D. and Young, D. 2009. `mixtools`: An R package for analyzing finite mixture models. *Journal of Statistical Software*, 32(6), pp.1-29.

Ram, K., and Wickham, H. 2015. `wesanderson`: a Wes Anderson palette generator. R package version 0.3.

**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
```

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plot\_GMM

*Plots Mixture Components from Gaussian Mixture Models*

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**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 <code>mixEM</code> 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**

Benaglia, T., Chauveau, D., Hunter, D. and Young, D., 2009. `mixtools`: An R package for analyzing finite mixture models. *Journal of Statistical Software*, 32(6), pp.1-29.

Wickham, H., 2016. `ggplot2`: elegant graphics for data analysis. Springer.

**Examples**

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

plot_GMM(mixmdl, 2)
```

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`plot_mix_comps`*Custom Function for Overlaying Mixture Components*

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**Description**

Plots a mixture component conditioned on a superimposed function

**Usage**

```
plot_mix_comps(x, mu, sigma, lam)
```

**Arguments**

<code>x</code>	Input data
<code>mu</code>	Mean of component
<code>sigma</code>	Variance of component
<code>lam</code>	Mixture weight of component

**Details**

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

**Examples**

```
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")
```

# Index

plot\_cut\_point, 2  
plot\_GMM, 3  
plot\_mix\_comps, 4