

Package ‘stabplot’

September 28, 2026

Type Package

Title Stability Plots for Lasso Stability Selection

Version 0.0.1

Description

Provides stability selection with Lasso and two diagnostic plots for assessing selection stability. The Regustab plot shows stability across the regularisation parameter grid, while the Convstab plot shows stability as a function of the number of subsamples. Methods are described in Nouraie and Muller (2026) <[doi:10.1080/03610926.2026.2715517](https://doi.org/10.1080/03610926.2026.2715517)>.

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Imports glmnet, latex2exp, ggplot2

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URL <https://github.com/MahdiNouraie/stabplot>,
<https://www.tandfonline.com/doi/full/10.1080/03610926.2026.2715517>

BugReports <https://github.com/MahdiNouraie/stabplot/issues>

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NeedsCompilation no

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Description

Provides two diagnostic plots for assessing stability selection with Lasso. The ‘Regustab’ function plots stability values across the regularisation parameter grid, supporting regularisation tuning based on selection stability. It highlights and returns ‘lambda.min’, ‘lambda.1se’, and ‘lambda.stable’ when the maximum stability exceeds 0.75. Otherwise, it returns ‘lambda.stable.1sd’, defined using a one-standard-deviation criterion. The ‘Convstab’ function plots stability values against the number of subsamples to assess the convergence of the stability estimates and returns variables with selection frequencies exceeding a specified threshold, which defaults to 0.5.

Author(s)

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Authors:

- Samuel Muller

References

Nouraie, M., & Muller, S. (2026). Stability-guided hyper-parameter tuning for stability selection. *Communications in Statistics - Theory and Methods*, 1–19.

Meinshausen, N., & Bühlmann, P. (2010). Stability selection. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 72(4), 417-473.

Nogueira, S., Sechidis, K., & Brown, G. (2018). On the stability of feature selection algorithms. *Journal of Machine Learning Research*, 18(174), 1-54.

<https://github.com/nogueirs/JMLR2018>

Tibshirani, R. (1996). Regression shrinkage and selection via the lasso. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 58(1), 267-288.

See Also

[Regustab](#), [Convstab](#)

Convstab	<i>Convstab</i>
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Description

Creates a diagnostic plot of stability estimates and their confidence intervals across sequential sub-samples in stability selection. The plot is constructed using ‘lambda.stable’ when the maximum stability exceeds 0.75; otherwise, ‘lambda.stable.lsd’ is used.

Usage

```
Convstab(x, y, B, alpha = 0.05, thr = 0.5)
```

Arguments

x	A numeric matrix of predictors.
y	A numeric vector of response values.
B	An integer specifying the number of subsamples.
alpha	A numeric value specifying the significance level for the confidence intervals.
thr	A numeric value specifying the minimum selection frequency for reporting selected variables.

Value

A list containing the stability plot (‘plot’) and a data frame of variables with selection frequencies exceeding ‘thr’ (‘selected’), returned invisibly. The plot is also displayed as a side effect.

References

Nouraie, M., & Muller, S. (2026). Stability-guided hyper-parameter tuning for stability selection. Communications in Statistics - Theory and Methods, 1–19.

Meinshausen, N., & Bühlmann, P. (2010). Stability selection. Journal of the Royal Statistical Society Series B: Statistical Methodology, 72(4), 417-473.

Nogueira, S., Sechidis, K., & Brown, G. (2018). On the stability of feature selection algorithms. Journal of Machine Learning Research, 18(174), 1-54.

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See Also

[stabplot](#)

Examples

```
set.seed(123)
x <- matrix(rnorm(1000), ncol = 10)
# create beta based on the first 3 columns of x and some error
beta <- c(0.5, 0.4, 0.3, rep(0, 7))
y <- x %*% beta + rnorm(100)
B <- 200
res <- Convstab(x, y, B) # Example usage of the Convstab function
res$selected
# output
# Variable Selection_Frequency
# 1      x1      0.970
# 2      x2      0.895
```

Regustab	<i>Regustab</i>
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Description

Creates a diagnostic plot of stability values across the regularisation parameter grid for Lasso stability selection. The plot highlights ‘lambda.min’ and ‘lambda.1se’ from cross-validation, as well as ‘lambda.stable’ when the maximum stability exceeds 0.75. Otherwise, ‘lambda.stable.1sd’, defined using a one-standard-deviation criterion, is highlighted.

Usage

```
Regustab(x, y, B)
```

Arguments

- x A numeric matrix of predictors.
- y A numeric vector of response values.
- B An integer specifying the number of subsamples.

Value

A list containing the selected regularisation values (‘min’, ‘1se’, and either ‘stable’ or ‘stable.1sd’), returned invisibly. A stability plot is also produced as a side effect.

References

Nourai, M., & Muller, S. (2026). Stability-guided hyper-parameter tuning for stability selection. *Communications in Statistics - Theory and Methods*, 1–19.

Meinshausen, N., & Bühlmann, P. (2010). Stability selection. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 72(4), 417-473.

Nogueira, S., Sechidis, K., & Brown, G. (2018). On the stability of feature selection algorithms. *Journal of Machine Learning Research*, 18(174), 1-54.

<https://github.com/nogueirs/JMLR2018>

Tibshirani, R. (1996). Regression shrinkage and selection via the lasso. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 58(1), 267-288.

See Also

[stabplot](#)

Examples

```
set.seed(123)
x <- matrix(rnorm(1000), ncol = 10)
# create beta based on the first 3 columns of x and some error
beta <- c(1, 2, 3, rep(0, 7))
y <- x %*% beta + rnorm(100)
B <- 10
res <- Regustab(x, y, B) # Example usage of the Regustab function
res
# output
# $min
# [1] 0.07609021
# `$1se`
# [1] 0.2550241
# $stable
#[1] 0.3371269
```

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