Package 'mupet'

January 21, 2026

Title Multiclass Performance Evaluation Toolkit

Version 0.1.0

Description Implementation of custom 'tidymodels' metrics for multi-class
prediction models with a single negative class. Currently are implemented
macro-average sensitivity and specificity as in Mortaz, Ebrahim (2020)
"Imbalance accuracy metric for model selection in multi-class imbalance
classification problems" <doi:10.1016/j.knosys.2020.106490> and a
generalized weighted Youden index as in Li, D.L., Shen F., Yin Y., Peng
J.X and Chen P.Y. (2013) "Weighted Youden index and its
two-independent-sample comparison based on weighted sensitivity and
specificity" <doi:10.3760/cma.j.issn.0366-6999.20123102>.

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Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

Encoding UTF-8

RoxygenNote 7.3.3

URL https://github.com/astamm/mupet, https://astamm.github.io/mupet/

BugReports https://github.com/astamm/mupet/issues

Imports rlang, yardstick

NeedsCompilation no

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Repository CRAN

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macro_average_sensitivity

Macro Average Sensitivity

Description

This function computes the macro-average sensitivity for a multi-class prediction model. It assumes that the *negative* class is the first one.

Usage

```
macro_average_sensitivity_vec(
  truth,
  estimate,
  estimator = NULL,
  na_rm = TRUE,
  case_weights = NULL,
  event_level = "first",
  ...
)

macro_average_sensitivity(data, ...)

## S3 method for class 'data.frame'
macro_average_sensitivity(
  data,
  truth,
  estimate,
  estimator = NULL,
  na_rm = TRUE,
  case_weights = NULL,
  event_level = "first",
  ...
)
```

Arguments

truth	The column identifier for the true class results (that is a factor).
estimate	The column identifier for the predicted class results (that is also factor).

estimator	One of: "binary", "macro", "macro_weighted", or "micro" to specify the type of averaging to be done.
na_rm	A logical value indicating whether NA values should be stripped before the computation proceeds.
case_weights	The optional column identifier for case weights.
event_level	A single string. Either "first" or "second" to specify which level of truth to consider as the "event". This argument is only applicable when estimator = "binary".
...	Currently unused.
data	Either a data.frame containing the columns specified by the truth and estimate arguments, or a table/matrix where the true class results should be in the columns of the table.

Value

A scalar storing the value of the macro-average sensitivity score.

Examples

```
fold1 <- subset(yardstick::hpc_cv, Resample == "Fold01")
macro_average_sensitivity_vec(fold1$obs, fold1$pred)
macro_average_sensitivity(fold1, obs, pred)
```

---

macro_average_specificity

Macro Average Specificity

Description

This function computes the macro-average specificity for a multi-class prediction model. It assumes that the *negative* class is the first one.

Usage

```
macro_average_specificity_vec(
  truth,
  estimate,
  estimator = NULL,
  na_rm = TRUE,
  case_weights = NULL,
  event_level = "first",
  ...
)

macro_average_specificity(data, ...)
```

```
## S3 method for class 'data.frame'
macro_average_specificity(
  data,
  truth,
  estimate,
  estimator = NULL,
  na_rm = TRUE,
  case_weights = NULL,
  event_level = "first",
  ...
)
```

Arguments

truth	The column identifier for the true class results (that is a factor).
estimate	The column identifier for the predicted class results (that is also factor).
estimator	One of: "binary", "macro", "macro_weighted", or "micro" to specify the type of averaging to be done.
na_rm	A logical value indicating whether NA values should be stripped before the computation proceeds.
case_weights	The optional column identifier for case weights.
event_level	A single string. Either "first" or "second" to specify which level of truth to consider as the "event". This argument is only applicable when estimator = "binary".
...	Currently unused.
data	Either a data.frame containing the columns specified by the truth and estimate arguments, or a table/matrix where the true class results should be in the columns of the table.

Value

A scalar storing the value of the macro-average specificity score.

Examples

```
fold1 <- subset(yardstick::hpc_cv, Resample == "Fold01")
macro_average_specificity_vec(fold1$obs, fold1$pred)
macro_average_specificity(fold1, obs, pred)
```

---

weighted_youden_index   *Weighted Youden Index*

Description

This function computes the weighted Youden index for a multi-class prediction model. It assumes that the *negative* class is the first one.

Usage

```
weighted_youden_index_vec(
  truth,
  estimate,
  sensitivity_weight = 0.5,
  estimator = NULL,
  na_rm = TRUE,
  case_weights = NULL,
  event_level = "first",
  ...
)

weighted_youden_index(data, ...)

## S3 method for class 'data.frame'
weighted_youden_index(
  data,
  truth,
  estimate,
  sensitivity_weight = 0.5,
  estimator = NULL,
  na_rm = TRUE,
  case_weights = NULL,
  event_level = "first",
  ...
)
```

Arguments

truth	The column identifier for the true class results (that is a factor).
estimate	The column identifier for the predicted class results (that is also factor).
sensitivity_weight	
	A scalar value specifying the weight to put on sensitivity. Defaults to `0.5` which puts equal weights to sensitivity and specificity.
estimator	One of: "binary", "macro", "macro_weighted", or "micro" to specify the type of averaging to be done.
na_rm	A logical value indicating whether NA values should be stripped before the computation proceeds.
case_weights	The optional column identifier for case weights.
event_level	A single string. Either "first" or "second" to specify which level of truth to consider as the "event". This argument is only applicable when estimator = "binary".
...	Currently unused.
data	Either a data.frame containing the columns specified by the truth and estimate arguments, or a table/matrix where the true class results should be in the columns of the table.

Value

A scalar storing the value of the weighted Youden index.

Examples

```
fold1 <- subset(yardstick::hpc_cv, Resample == "Fold01")
weighted_youden_index_vec(fold1$obs, fold1$pred)
weighted_youden_index(fold1, obs, pred)
```

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