Package 'outrigger'

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Type Package

Title Outrigger Regression

Version 1.1.0

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Description Performs outrigger local polynomial regression/ distributional adaptation, using a score-matching spline estimator of the conditional score function.
Details of the method can be found in Young, Shah and Samworth (2026) <doi:10.48550/arXiv.2603.11282>.

License GPL-3

Encoding UTF-8

Imports Rcpp, np, mgcv, RColorBrewer

LinkingTo Rcpp

Suggests testthat (>= 3.0.0)

RoxygenNote 7.2.3

NeedsCompilation yes

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Repository CRAN

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outrigger	*Performs outrigger regression at a point x*

Description

Performs outrigger regression at a point x

Usage

```
outrigger(
  formula,
  data,
  xtest,
  degree = 0,
  bandwidth = NULL,
  kernel = "epan",
  lambda = NULL,
  folds = 5,
  scoregranality = 1,
  score_df = 10,
  verbose = TRUE
)
```

Arguments

formula	formula (as in e.g. `lm`).
data	data frame.
xtest	datapoint(s) for local estimation.
degree	degree of polynomial.
bandwidth	bandwidth parameter. If NULL a rule-of-thumb bandwidth is selected by least-squares cross-validation for the standard local polynomial estimator.
kernel	kernel for local polyomial. Default is epanechnikov kernel.
lambda	orthogonalisation parameter. By default takes $\lambda = 4(1 + 0.5\log(n))$.
folds	number of folds for cross-fitting. Default is 5.
scoregranality	the number of bins to split covariate-space $|X - x| \leq \lambda h$ for conditional score estimation.
score_df	number of degrees of freedom for score matching splines used for conditional score estimation. Input can be a numeric value (e.g. 10 on larger datasets, 6 on smaller datasets) or "cross-validation" or "cross-validation-quick", in which case score-matching-CV will be performed (may be computationally costly).
verbose	suppresses messages of progress. Default is TRUE.

Value

If x is a single point, return a list containing:

prediction The outrigger local polynomial estimator $\hat{f}(x)$ at x.

fitted_vector For the local linear outrigger estimator, the full fitted vector at x

standardlocpol_fitted_vector The fitted vector for the standard local polynomial

score_plot_metadata Data used for score_plotting to plot the fitted conditional score functions

If x is a vector of points, return a dataset with points x and associated outrigger fitted values.

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score_plots	*Plots the fitted score functions learnt in an* outrigger *fit.*

Description

Plots the fitted score functions learnt in an outrigger fit.

Usage

```
score_plots(fitted_outrig, plot_together = TRUE)
```

Arguments

fitted_outrig a fitted object from outrigger

plot_together a logical denoting whether all score function estimators (across all covariate bins) should be plotted toghether. Default is TRUE.

Value

No return value, called for plotting the estimated score function.

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