

Package ‘RegEnRF’

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Type Package
Title Regression-Enhanced Random Forests
Version 1.0.0
Description A novel generalized Random Forest method, that can improve on RFs by borrowing the strength of penalized parametric regression. Based on Zhang et al. (2019) <[doi:10.48550/arXiv.1904.10416](https://doi.org/10.48550/arXiv.1904.10416)>.
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NeedsCompilation no
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predict.RegEnRF	<i>Prediction of test data using Regression-Enhanced Random Forests.</i>
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Description

Prediction of test data using Regression-Enhanced Random Forests.

Usage

```
## S3 method for class 'RegEnRF'
predict(object, newx, ...)
```

Arguments

object	an object of class "RegEnRF", as that created by the function RegEnRF
newx	matrix of new values for x at which predictions are to be made function will abort.
...	other arguments passed to glmnet::predict.glmnet and randomForest::predict.randomForest .

Value

A vector of predicted values.

Examples

```
set.seed(111)
x <- matrix(rnorm(100 * 20), 100, 20)
y <- rnorm(100)
mod <- RegEnRF(x, y, lambda = 0.1)
predict(mod, newx = x)
```

RegEnRF	<i>Regression-Enhanced Random Forests</i>
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Description

RegEnRF() implements Regression-Enhanced Random Forests algorithm (based on Zhang et al., 2019 paper) for regression.

Usage

```
RegEnRF(x, y, lambda, ...)
```

Arguments

x	A numeric matrix of predictors. Requirement: <code>nvars > 1</code> ; in other words, x should have 2 or more columns. This is a constraint of <code>glmnet::glmnet()</code> .
y	A numeric response vector.
lambda	See 'lambda' argument in <code>glmnet::glmnet()</code> .
...	other arguments passed to <code>glmnet::glmnet()</code> and <code>randomForest::randomForest()</code> .

Details

This function is based on the packages `randomForest::randomForest` and `glmnet::glmnet`.

Value

An object with S3 class "RegEnRF"

Author(s)

Umberto Minora <umbertofilippo@tiscali.it>, based on the paper by Zhang et al. (2019).

References

Zhang, H., Nettleton, D., & Zhu, Z. (2019). Regression-enhanced random forests. arXiv preprint [doi:10.48550/arXiv.1904.10416](https://doi.org/10.48550/arXiv.1904.10416).

Examples

```
set.seed(111)
data(co2)
x <- matrix(c(time(co2), cycle(co2)), ncol = 2)
y <- as.numeric(co2)
mod <- RegEnRF(x, y, lambda = 0.1)
freq <- frequency(co2)
startt <- tsp(co2)[2] + 1 / freq
xnew.t <- seq(startt, by = 1 / freq, length.out = freq * 3)
xnew <- matrix(c(xnew.t, cycle(tail(co2, freq * 3))), ncol = 2)
pred <- predict(mod, xnew)
pred.ts <- ts(pred, start = startt, frequency = freq)
plot(ts.union(co2, pred.ts), plot.type = "single", col = c("black", "red"))
```

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