Package 'SAMGEP'

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Type Package

Title A Semi-Supervised Method for Prediction of Phenotype Event Times

Version 0.1.0-1

Description A novel semi-supervised machine learning algorithm to predict phenotype event times using Electronic Health Record (EHR) data.

URL https://github.com/celehs/SAMGEP

BugReports https://github.com/celehs/SAMGEP/issues

License GPL-3

Encoding UTF-8

RoxygenNote 7.1.1

Depends R (>= 3.5.0)

Imports stats, mvtnorm, nlme, pROC, abind, nloptr, foreach, doParallel, parallel, Rcpp

LinkingTo Rcpp, RcppArmadillo

Suggests knitr, rmarkdown

VignetteBuilder knitr

LazyData true

NeedsCompilation yes

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SAMGEP-package *SAMGEP: A Semi-supervised Method for Prediction of Phenotype Event Times Using the Electronic Health Record*

Description

Semi-supervised Adaptive Markov Gaussian Embedding Process (SAMGEP) is a novel semi-supervised machine learning algorithm to predict phenotype event times using Electronic Health Record (EHR) data.

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samgep *Semi-supervised Adaptive Markov Gaussian Process (SAMGEP)*

Description

Semi-supervised Adaptive Markov Gaussian Process (SAMGEP)

Usage

```
samgep(
  dat_train = NULL,
  dat_test = NULL,
  Cindices = NULL,
  w = NULL,
  w0 = NULL,
  V = NULL,
  observed = NULL,
  nX = 10,
  covs = NULL,
  survival = FALSE,
  Estep = Estep_partial,
  Xtrain = NULL,
  Xtest = NULL,
  alpha = NULL,
  r = NULL,
  lambda = NULL,
  surrIndex = NULL,
  nCores = 1
)
```

Arguments

dat_train	(optional if Xtrain is supplied) Raw training data set, including patient IDs (ID), healthcare utilization feature (H) and censoring time (C)
dat_test	(optional) Raw testing data set, including patient IDs (ID), a healthcare utilization feature (H) and censoring time (C)
Cindices	(optional if Xtrain is supplied) Column indices of EHR feature counts in dat_train/dat_test
w	(optional if Xtrain is supplied) Pre-optimized EHR feature weights
w0	(optional if Xtrain is supplied) Initial (i.e. partially optimized) EHR feature weights
V	(optional if Xtrain is supplied) nFeatures x nEmbeddings embeddings matrix
observed	(optional if Xtrain is supplied) IDs of patients with observed outcome labels
nX	Number of embedding features (defaults to 10)
covs	(optional) Baseline covariates to include in model; not yet operational
survival	Binary indicator of whether target phenotype is of type survival (i.e. stays positive after incident event) or relapsing-remitting (defaults to FALSE)
Estep	E-step function to use (Estep_partial or Estep_full; defaults to Estep_partial)
Xtrain	(optional) Embedded training data set, including patient IDs (ID), healthcare utilization feature (H) and censoring time (C)
Xtest	(optional) Embedded testing data set, including patient IDs (ID), healthcare utilization feature (H) and censoring time (C)
alpha	(optional) Relative weight of semi-supervised to supervised MGP predictors in SAMGEP ensemble
r	(optional) Scaling factor of inter-temporal correlation
lambda	(optional) L1 regularization hyperparameter for feature weight (w) optimization
surrIndex	(optional) Index (within Cindices) of primary surrogate index for outcome event
nCores	Number of cores to use for parallelization (defaults to 1)

Value

w_opt Optimized feature weights (w)

r_opt Optimized inter-temporal correlation scaling factor (r)

alpha_opt Optimized semi-supservised:supervised relative weight (alpha)

lambda_opt Optiized L1 regularization hyperparameter (lambda)

margSup Posterior probability predictions of supervised model (MGP Supervised)

margSemisup Posterior probability predictions of semi-supervised model (MGP Semi-supervised)

margMix Posterior probability predictions of SAMGEP

cumSup Cumulative probability predictions of supervised model (MGP Supervised)

cumSemisup Cumulative probability predictions of semi-supervised model (MGP Semi-supervised)

cumMix Cumulative probability predictions of SAMGEP

`simdata` *Simulated Dataset*

Description

Click HERE to view details.

Usage

```
simdata
```

Format

An object of class `list` of length 3.

Examples

```
str(simdata)
```

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