Package 'CMFsurrogate'

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Type Package

Title Calibrated model fusion approach to combine surrogate markers

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Description Uses a calibrated model fusion approach to optimally combine multiple surrogate markers. Specifically, two initial estimates of optimal composite scores of the markers are obtained; the optimal calibrated combination of the two estimated scores is then constructed which ensures both validity of the final combined score and optimality with respect to the proportion of treatment effect explained (PTE) by the final combined score. The primary function estimates the PTE of the identified combination of multiple surrogate markers.

License GPL

Imports splines, MASS, stats

NeedsCompilation no

Depends R (>= 3.5.0)

R topics documented:

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example.data   *Example data*

Description

Example data

Usage

```
data("example.data")
```

Format

A list with 3 elements:

sob the surrogate markers

yob the primary outcome

aob the treatment indicator

Examples

```
data(example.data)
names(example.data)
```

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gen.bootstrap.weights *Generate bootstrap sample*

Description

Generate bootstrap sample

Usage

```
gen.bootstrap.weights(n, num.perturb = 500)
```

Arguments

n   sample size

num.perturb   number of replicates/resamples

Value

matrix with n rows and num.perturb columns of indeces

Kern.FUN *helper function*

Description

helper function

Usage

```
Kern.FUN(zz, zi, bw)
```

Arguments

zz	zz
zi	zi
bw	bw

Value

kernel matrix

Kern.FUN.d *helper function*

Description

helper function

Usage

```
Kern.FUN.d(zz, zi, bw)
```

Arguments

zz	zz
zi	zi
bw	bw

Value

kernel matrix

Kern.FUN.M   *helper function*

Description

helper function

Usage

```
Kern.FUN.M(zz, zi, bw)
```

Arguments

zz   zz

zi   zi

bw   bw

Value

kernel matrix

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pte.estimate.multiple   *Estimates the proportion of treatment effect explained by the optimal combination of multiple surrogate markers using a calibrated model fusion approach*

Description

Estimates the proportion of treatment effect explained by the optimal combination of multiple surrogate markers using a calibrated model fusion approach

Usage

```
pte.estimate.multiple(sob, yob, aob, var = TRUE, rep = 500)
```

Arguments

sob   surrogates

yob   primary outcome, y

aob   treatment indicator

var   TRUE or FALSE, if variance/SE of PTE is being requested

rep   if var is TRUE, number of resampled draws to use for bootstrap

Value

pte.es   Estimate of the proportion of treatment effect explained (PTE)

pte.se   if var = TRUE, estimate of the standard error of the PTE

References

Wang X, Parast L, Tian L, Han L, Cai T. Robust Approach to Combining Multiple Markers to Improve Surrogacy. (Under Review)

Examples

```
data(example.data)
out=pte.estimate.multiple(sob=example.data$sob, yob=example.data$yob, aob=example.data$aob, var = FALSE)
out
```

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resam	*Estimates quantities using resampled data*

Description

Estimates quantities using resampled data

Usage

```
resam(index, yob, sob, aob, n)
```

Arguments

index	index
yob	y
sob	surrogates
aob	treatment
n	n

Value

Outputs parametric estimate, additative linear estimate, and convex combination estimate

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VTM	*Helper function*

Description

Helper function; this function creates a matrix that repeats vc, dm times where each row is equal to the vc vector.

Usage

```
VTM(vc, dm)
```

Arguments

vc	the vector to repeat.
dm	number of rows.

Value

a matrix that repeats vc, dm times where each row is equal to the vc vector

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