

Package ‘gcatest’

October 17, 2020

Title Genotype Conditional Association TEST

Version 1.18.0

Date 2015-10-09

Author Wei Hao, Minsun Song, John D. Storey

Maintainer Wei Hao <whao@princeton.edu>, John D. Storey <jstorey@princeton.edu>

LazyData true

Description GCAT is an association test for genome wide association studies that controls for population structure under a general class of trait models.

Imports lfa

Depends R (>= 3.2)

Suggests knitr, ggplot2

VignetteBuilder knitr

License GPL-3

biocViews SNP, DimensionReduction, PrincipalComponent, GenomeWideAssociation

BugReports <https://github.com/StoreyLab/gcatest/issues>

URL <https://github.com/StoreyLab/gcatest>

git_url <https://git.bioconductor.org/packages/gcatest>

git_branch RELEASE_3_11

git_last_commit f54aa04

git_last_commit_date 2020-04-27

Date/Publication 2020-10-16

R topics documented:

gcat	2
sim_genotype	3
sim_trait	3
Index	4

`gcat`*Genotype Conditional Association TEST*

Description

Performs the GCAT test for association between SNPs and trait, and returns the p-values.

Usage

```
gcat(X, LF, trait, adjustment = NULL)
```

```
gcatest(X, LF, trait, adjustment = NULL)
```

```
gcat.stat(X, LF, trait, adjustment = NULL)
```

Arguments

<code>X</code>	a matrix of SNP genotypes, i.e. an integer matrix of 0's, 1's, and 2's. Sparse matrices of class <code>Matrix</code> are not supported (yet).
<code>LF</code>	matrix of logistic factors outputted from function <code>lfa</code>
<code>trait</code>	vector
<code>adjustment</code>	matrix of adjustment variables

Value

vector of p-values

Functions

- `gcatest`:
- `gcat.stat`: returns the association statistics instead of the p-value.

References

Song, M, Hao, W, Storey, JD (2015). Testing for genetic associations in arbitrarily structured populations. *Nat. Genet.*, 47, 5:550-4.

Examples

```
library(lfa)
LF = lfa(sim_genos, 3)
gcat_p = gcat(sim_genos, LF, sim_trait)
gcat_stat = gcat.stat(sim_genos, LF, sim_trait)
```

sim_geno	<i>Simulated data from PSD model</i>
----------	--------------------------------------

Description

10,000 SNPs, 1,000 individuals, first five SNPs are associated.

Usage

sim_geno

Format

a matrix of 0's, 1's and 2's for the genotypes

Value

simulated genotype matrix

sim_trait	<i>Simulated data from PSD model</i>
-----------	--------------------------------------

Description

10,000 SNPs, 1,000 individuals, first five SNPs are associated.

Usage

sim_trait

Format

a vector of traits

Value

simulated traits

Index

gcat, [2](#)
gctest (gcat), [2](#)

sim_geno, [3](#)
sim_trait, [3](#)