Package 'GHQp'

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Type Package

Title Gauss Hermite Quadrature with pruning.

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Description The GHQ function can be used to obtain the quadrature points and weights to approximate an integral in two or more dimensions. This function uses the pruning approach to eliminate that points that do not contribute to the approximation of the integral and increases computational cost. The advantage to conducting this elimination of points is the decrease in the number of times that the function of interest is evaluated. This advantage is crucial in mixed models in which we must address several integrations within an iterative process to obtain model parameters.

License GPL (>= 2)

Depends R (>= 2.10), statmod

Suggests scatterplot3d

NeedsCompilation no

Repository CRAN

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R topics documented:

GHQp-package *Gaussian Hermite Quadrature with prunning*

Description

This package has a function that is used to obtain quadrature points to approximate an integral applying the pruning approach to eliminate some points that contribute little to the approximation.

Author(s)

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GHQ *Gaussian Hermite Quadrature with prunning*

Description

This function is used to obtain quadrature points to approximate an integral

Usage

```
GHQ(n, ndim, pruning = TRUE)
```

Arguments

n	number of quadrature points
ndim	number of integrals or dimension problem
pruning	a logical indicating whether you want pruning approach, by default is TRUE

Value

nodes	nodes
weights	weights
product	product weights

Author(s)

Freddy Hernandez Barajas

References

Hernandez, F., Usuga, O. and Giampaoli, V. (2014). Improving the Adaptive Gaussian Quadrature. Journal of Statistical Software, submitting.

Examples

```
# Comparing the number of points in a two-dimensional case
require(GHQp)
par(mfrow=c(2,2))
plot(GHQ(15,2,FALSE)$nodes,pch=20,xlab='',ylab='',
     main='Without pruning, n=15 and q=2')
plot(GHQ(15,2,TRUE)$nodes, pch=20,xlab='',ylab='',
     main='With pruning, n=15 and q=2')

# Comparing the number of points in a three-dimensional case
require(scatterplot3d)
datos <- GHQ(15,3,FALSE)$nodes
scatterplot3d(datos, type="p", highlight.3d=TRUE,
              angle=55, scale.y=0.7, pch=16,
              main='Without pruning, n=15 and q=3',
              cex.symbols=0.4,xlab='',ylab='',zlab='')
datos <- GHQ(15,3,TRUE)$nodes
scatterplot3d(datos, type="p", highlight.3d=TRUE,
              angle=55, scale.y=0.7, pch=16,
              main='With pruning, n=15 and q=3',
              cex.symbols=0.4,xlab='',ylab='',zlab='')
```

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