Package ‘QCSIS’

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Type Package

Title Sure Independence Screening via Quantile Correlation and Composite Quantile Correlation

Version 0.1

Date 2015-12-02

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Description Quantile correlation-sure independence screening (QC-SIS) and composite quantile correlation-sure independence screening (CQC-SIS) for ultrahigh-dimensional data.

License GPL-2

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R topics documented:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>QCSIS-package</td>
<td>2</td>
</tr>
<tr>
<td>cqc</td>
<td>3</td>
</tr>
<tr>
<td>CQCSIS</td>
<td>4</td>
</tr>
<tr>
<td>qc</td>
<td>5</td>
</tr>
<tr>
<td>QCSIS</td>
<td>6</td>
</tr>
</tbody>
</table>

Index 7
Description
Quantile correlation-sure independence screening (QC-SIS) and composite quantile correlation-sure independence screening (CQC-SIS) for ultrahigh-dimensional data.

Details
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Index of help topics:
- CQCSIS: Compsoete Quantile Correlation-Sure Independence Screening (CQC-SIS)
- QCSIS: Quantile Correlation-Sure Independence Screening (QC-SIS)
- QCSIS-package: Sure Independence Screening via Quantile Correlation and Composite Quantile Correlation
- cqc: Composite Quantile Correlation
- qc: Quantile Correlation

Author(s)
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References
Xuejun Ma et al.. Robust feature screening via composite quantile correlation learning. In submission.
cqc

Composite Quantile Correlation

Description

cqc is used to compute the composite quantile correlation.

Usage

cqc(x, y)

Arguments

x The covariate variable.
y The response variable.

Value

cqc The value of composite quantile correlation.

Author(s)

Xuejun Ma, Jingxiao Zhang, Jingke Zhou

References

Xuejun Ma et al. Robust feature screening via composite quantile correlation learning. In submission.

Examples

x <- rnorm(100)
y <- rnorm(100)
cqc(x = x, y = y)
CQCSIS

Compsote Quantile Correlation-Sure Independence Screening (CQC-SIS)

Description

The function implements the composite quantile correlation-sure independence screening (CQC-SIS).

Usage

CQCSIS(x, y, d)

Arguments

x
The design matrix, of dimensions n * p, without an intercept.

y
The response vector of dimension n * 1.

d
The tuning parameter used to covarites had significant effect on the response variable, such as \([n/\log(n)]\), or n-1.

Value

w
The estimate of w.

m
The subscript of x recuited by CQC-SIS.

Author(s)

Xuejun Ma, Jingxiao Zhang, Jingke Zhou

References

Xuejun Ma et al. Robust feature screening via composite quantile correlation learning. In submission.

Examples

n <- 20
p <- 200
x <- matrix(rnorm(n * p), n, p)
e <- rnorm(n, 0, 1)
bet1 <- 3 - runif(1)
bet2 <- 3 - runif(1)
bet3 <- 3 - runif(1)
y <- bet1 * x[, 1] + bet2 * x[, 2] + bet3 * x[, 3] + e
d <- 19
fit.CQCSIS <- CQCSIS(x = x, y = y, d = d)
fit.CQCSIS$m
Quantile Correlation

Description

qc is used to compute the quantile correlation with given quantiles.

Usage

qc(x, y, tau)

Arguments

x         The covariate variable.
y         The response variable.
tau       The quantile(s) to be estimated.

Value

tau       The quantile(s).
rho       The value of quantile correlation.

Author(s)

Xuejun Ma, Jingxiao Zhang, Jingke Zhou

References


Examples

n <- 1000
x <- rnorm(n)
y <- 2 * x + rt(n, df = 1)
tau <- 1:9 / 10
qc(x = x, y = y, tau = tau)
Description

The function implements the quantile correlation-sure independence screening (QC-SIS).

Usage

\texttt{QCSIS(x, y, tau, d)}

Arguments

\begin{itemize}
  \item \texttt{x} \quad \text{The design matrix, of dimensions n \times p, without an intercept.}
  \item \texttt{y} \quad \text{The response vector of dimension n \times 1.}
  \item \texttt{tau} \quad \text{The quantile(s) to be estimated. By default, tau=1:(n-1)/n.}
  \item \texttt{d} \quad \text{The tuning parameter used to covarites had significant effect on the response variable, such as \left\lfloor \frac{n}{\log(n)} \right\rfloor, or n-1}
\end{itemize}

Value

\begin{itemize}
  \item \texttt{w} \quad \text{The estimate of } w.
  \item \texttt{M} \quad \text{The subscript of } x \text{ recuited by QC-SIS.}
\end{itemize}

Author(s)

Xuejun Ma, Jingxiao Zhang, Jingke Zhou

References


Examples

\begin{verbatim}
n <- 20
p <- 200
r <- 0.05
x <- matrix(rnorm(n * p), n, p)
e <- rnorm(n, 0, 1)
inde <- sample(n, r * n)
x[inde, 1] <- 2 * sqrt(rchisq(r * n, df = p))
y <- 5 * x[, 1] + 5 * x[, 2] + 5 * x[, 3] + e
d <- 19
fit.QCSIS <- QCSIS(x = x, y = y, d = d)
fit.QCSIS$M
\end{verbatim}
Index

cqc, 3
CQCSIS, 4

qc, 5
QCSIS, 6
QCSIS-package, 2