Package ‘sdafilter’
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Title Symmetrized Data Aggregation
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Description We develop a new class of distribution free multiple testing rules for false discovery rate (FDR) control under general dependence. A key element in our proposal is a symmetrized data aggregation (SDA) approach to incorporating the dependence structure via sample splitting, data screening and information pooling. The proposed SDA filter first constructs a sequence of ranking statistics that fulfill global symmetry properties, and then chooses a data driven threshold along the ranking to control the FDR. For more information, see the website below and the accompanying paper: Du et al. (2020), "False Discovery Rate Control Under General Dependence By Symmetrized Data Aggregation", <arXiv:2002.11992>.
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R topics documented:

SDA_M

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Symmetrized Data Aggregation

Description

This is the core function for the paper posted in arXiv preprint arXiv:2002.11992

Usage

SDA_M(dat, alpha, Omega, nonsparse = FALSE, stable = TRUE)

Arguments

dat a \( n \times p \) data matrix
alpha the FDR level
Omega the inverse covariance matrix; if missing, it will be estimated by the glasso package
nonsparse if TRUE, the covariance matrix will be estimated by the POET package
stable if TRUE, the sample will be randomly splitted B=10 times for stability performance; otherwise, only single sample splitting is used.

Value

the indices of the hypotheses rejected

Examples

\[
\begin{align*}
n &= 50 \\
p &= 100 \\
dat &= \text{matrix}(\text{rnorm}(n*p), \text{nrow}=n) \\
mu &= \text{rep}(0, p) \\
mu[1:as.integer(0.1*p)] &= 0.3 \\
dat &= \text{dat}+\text{rep}(1, n)\times\text{t}(\mu) \\
alpha &= 0.2 \\
out &= \text{SDA_M(dat, alpha, diag(p))} \\
\text{print(out)}
\end{align*}
\]
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