

# Package ‘factoptd’

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**Title** Factorial Optimal Designs for Two-Colour cDNA Microarray Experiments

**Author** Dibaba Bayisa Gemechu, Legesse Kassa Debusho, and Linda Haines

**Maintainer** Dibaba Bayisa Gemechu <diboobayu@gmail.com>

**Depends** R (>= 3.4.0), MASS, partitions

**License** GPL-2

**Description**

Computes factorial A-, D- and E-optimal designs for two-colour cDNA microarray experiments.

**NeedsCompilation** no

**Repository** CRAN

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## R topics documented:

factoptd . . . . .	1
<b>Index</b>	<b>4</b>

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factoptd	<i>Factorial optimal designs for two-colour cDNA microarray experiments</i>
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**Description**

Used to compute factorial A-, D- or E-optimal designs for two-colour cDNA microarray experiments.

**Usage**

```
factoptd(narys, Optcrit = "", desvect,...)
```

```
## Default S3 method:
factoptd(narys, Optcrit = "", desvect,...)
## S3 method for class 'factoptd'
print(x, ...)
```

**Arguments**

narys	integer, specifying number of arrays.
desvect	matrix, specifying design vectors (see Debusho, Haines and Gemechu (2014) for more details).
Optcrit	character, specifying the optimality criteria to be used. <code>Optcrit</code> takes the letter "A", "D" and "E" for factorial A-, D- and E-optimal designs, respectively.
x	the object to be printed.
...	not used.

**Details**

factoptd computes factorial optimal designs for the two-colour cDNA microarray experiments for a given design vectors and number of arrays by making use to the complete enumeration methods proposed in Debusho, Haines and Gemechu (2014).

**Value**

Returns resultant factorial A-, D- or E-optimal design(s) with their corresponding score value. Specifically:

call	the method call.
b	number of arrays.
desvect	Design vestors
Optcrit	optimality criteria.
tnfd	Total number of resultant optimal factorial design(s)
optfctd	obtained factorial optimal design. Each row of <code>optfctd</code> represents different designs allocation/"frequency" vectors.
optscv	score value of the optimality criteria ' <code>Optcrit</code> ' of the resultant factorial optimal design(s), ' <code>optfctd</code> '.

NB: The function factoptd also saves the summary of the resultant factorial optimal design(s) in .csv format in the R session's temporary directory.

**Author(s)**

Dibaba Bayisa Gemechu, Legesse Kassa Debusho, and Linda Haines

## References

Debushe, L. K., Gemechu, D. B. and Haines, L. M. (2014). Optimal Factorial Designs for Two-Colour Microarray Experiments: Properties Of Admissible Designs, A-, D- And E-Optimality Criteria. Peer-reviewed Proceedings of the Annual Conference of the South African Statistical Association for 2014 (SASA 2014), Rhodes University, Grahamstown, South Africa. pp 17 - 24, ISBN: 978-1-86822-659-7.

## Examples

```
##To obtain factorial A-optimal design for a given
##design vector using 9 slides/arrays, set

narys <- 9 #Number of arrays

desvect = rbind(c(0,2,-2),c(-2,0,-2),
               c(-2,2,0),c(0,2,2),
               c(-2,0,2),c(-2,-2,0)) #Design vector

Optcrit <- "A" #Optimality criteria

factoptdA <- factoptd(narys = 9, Optcrit = "A", desvect =
                    rbind(c(0,2,-2),c(-2,0,-2),c(-2,2,0),c(0,2,2),c(-2,0,2),c(-2,-2,0)))

print(factoptdA)
```

# Index

\*Topic **Factorial A-optimal designs**

factoptd, [1](#)

\*Topic **Factorial D-optimal designs**

factoptd, [1](#)

\*Topic **Factorial E-optimal designs**

factoptd, [1](#)

\*Topic **Microarray experiment**

factoptd, [1](#)

factoptd, [1](#)

print.factoptd (factoptd), [1](#)