Package 'LowWAFOMSobol'

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Type Package

Title Low WAFOM Sobol Sequence

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Author Shinsuke Mori [aut],
Ryuichi Ohori [aut],
Makoto Matsumoto [aut],
Mutsuo Saito [cre]

Maintainer Mutsuo Saito <sai10@hiroshima-u.ac.jp>

Description Implementation of Low Walsh Figure of Merit (WAFOM) sequence based on Sobol sequence.

URL https://mersennetwister-lab.github.io/LowWAFOMSobol/

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Imports Rcpp (>= 0.12.9), RSQLite (>= 2.0)

LinkingTo Rcpp

Suggests knitr, rmarkdown, testthat

VignetteBuilder knitr

RoxygenNote 6.0.1

NeedsCompilation yes

Repository CRAN

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Contents

LowWAFOMSobol-package *Low WAFOM Sobol Sequence*

Description

Description: R implementation of Low Walsh Figure of Merit (WAFOM) Sequence based on Sobol Sequence.

Details

Porting to R by Mutsuo Saito. The R version does not return coordinate value zero, but returns value very near to zero, 2^-64.

Acknowledgment

The development of this code is partially supported by JST CREST.

Reference

* Shinsuke Mori, "Suuchi Sekibun no tameno QMC Ten Shuugou no Sekkei, Tansaku, oyobi sono Yuukousei", Master's Thesis, 2017, * Ryuichi Ohori, "Efficient Quasi Monte Carlo Integration by Adjusting the Derivation-sensitivity Parameter of Walsh Figure of Merit", Master's Thesis, 2015. * S. Harase and R. Ohori, "A search for extensible low-WAFOM point sets", arXiv preprint, arXiv:1309.7828, (2013), https://arxiv.org/abs/1309.7828. * Harase, S. (2016). "A search for extensible low-WAFOM point sets", Monte Carlo Methods and Applications, 22(4), pp. 349-357, 2017. * M. Matsumoto and R. Ohori, "Walsh Figure of Merit for Digital Nets: An Easy Measure for Higher Order Convergent QMC", Springer International Publishing, Cham, 2016, pp. 143-160. * M. Matsumoto, M. Saito, and K. Matoba, "A computable figure of merit for quasi-Monte Carlo point sets", Mathematics of Computation, 83 (2014), pp. 1233-1250. * S. Joe and F. Y. Kuo, "Constructing Sobol sequences with better two-dimensional projections", SIAM J. Sci. Comput. 30, 2635-2654 (2008).

Examples

```
srange <- lowWAFOMSobol.dimMinMax()
mrange <- lowWAFOMSobol.dimF2MinMax(srange[1])
points <- lowWAFOMSobol.points(dimR=srange[1], dimF2=mrange[1])
points <- lowWAFOMSobol.points(dimR=srange[1], dimF2=mrange[1], digitalShift=TRUE)
```

lowWAFOMSobol.dimF2MinMax

get minimum and maximum F2 dimension number.

Description

get minimum and maximum F2 dimension number.

Usage

```
lowWAFOMSobol.dimF2MinMax(dimR)
```

Arguments

dimR	dimension.

Value

supported minimum and maximum F2 dimension number

lowWAFOMSobol.dimMinMax

get minimum and maximum dimension number of Low WAFOM Niederreiter-Xing Sequence

Description

get minimum and maximum dimension number of Low WAFOM Niederreiter-Xing Sequence

Usage

```
lowWAFOMSobol.dimMinMax()
```

Value

supported minimum and maximum dimension number.

`lowWAFOMSobol.points` *get points from Low WAFOM SobolSequence*

Description

This R version does not returns coordinate value zero, but returns value very near to zero, 2^-64.

Usage

```
lowWAFOMSobol.points(dimR, dimF2 = 10, digitalShift = FALSE)
```

Arguments

`dimR`	dimension.
`dimF2`	F2-dimension of each element.
`digitalShift`	use digital shift or not.

Value

matrix of points where every row contains dimR dimensional point.

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