

Package ‘LowWAFOMNX’

July 21, 2025

Type Package

Title Low WAFOM Niederreiter-Xing Sequence

Version 1.1.1

Date 2017-08-21

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 Niederreiter-Xing sequence <[DOI:10.1007/978-3-642-56046-0_30](https://doi.org/10.1007/978-3-642-56046-0_30)>.

URL <https://mersennetwister-lab.github.io/LowWAFOMNX/>

License BSD_3_clause + file LICENSE

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

LinkingTo Rcpp

Suggests knitr, rmarkdown, testthat

VignetteBuilder knitr

RoxygenNote 6.0.1

NeedsCompilation yes

Repository CRAN

Date/Publication 2017-08-25 03:16:24 UTC

Contents

LowWAFOMNX-package	2
lowWAFOMNX.dimF2MinMax	3
lowWAFOMNX.dimMinMax	3
lowWAFOMNX.points	4
Index	5

Description

Description: R implementation of Low Walsh Figure of Merit Sequence based on Niederreiter-Xing 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 tamenno 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. * G. Pirsic, "A software implementation of Niederreiter-Xing sequences", in Monte Carlo and Quasi-Monte Carlo Methods 2000, Springer, 2002, pp. 434-445. <https://sites.google.com/site/isabelpirsic/nxlegacy>. * C. P. Xing and H. Niederreiter, "A construction of low-discrepancy sequences using global function fields", ACTA ARITHMETICA, 73 (1995), pp. 87-102.

Examples

```

srange <- lowWAFOMNX.dimMinMax()
mrangle <- lowWAFOMNX.dimF2MinMax(srange[1])
points <- lowWAFOMNX.points(dimR=srange[1], dimF2=mrangle[1])
points <- lowWAFOMNX.points(dimR=srange[1], dimF2=mrangle[1], digitalShift=TRUE)

```

lowWAFOMNX.dimF2MinMax	<i>get minimum and maximum F2 dimension number.</i>
------------------------	---

Description

get minimum and maximum F2 dimension number.

Usage

lowWAFOMNX.dimF2MinMax(dimR)

Arguments

dimR dimention.

Value

supported minimum and maximum F2 dimension number

lowWAFOMNX.dimMinMax	<i>get minimum and maximum dimension number of Low WAFOM Niederreiter-Xing Sequence</i>
----------------------	---

Description

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

Usage

lowWAFOMNX.dimMinMax()

Value

supported minimum and maximum dimension number.

lowWAFOMNX.points	<i>get points from Low WAFOM Niederreiter-XingSobolSequence</i>
-------------------	---

Description

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

Usage

```
lowWAFOMNX.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.

Index

LowWAFOMNX (LowWAFOMNX-package), [2](#)
LowWAFOMNX-package, [2](#)
lowWAFOMNX.dimF2MinMax, [3](#)
lowWAFOMNX.dimMinMax, [3](#)
lowWAFOMNX.points, [4](#)