Package ‘N2R’

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Type Package

Title Fast and Scalable Approximate k-Nearest Neighbor Search Methods using 'N2' Library

Version 1.0.1


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Encoding UTF-8

Depends Matrix

Imports Rcpp (>= 1.0.4)

Suggests testthat

LinkingTo Rcpp, RcppSpdlog, RcppEigen

SystemRequirements C++11, GNU make

RoxygenNote 7.1.2

URL https://github.com/kharchenkolab/N2R

BugReports https://github.com/kharchenkolab/N2R/issues

NeedsCompilation yes

Author Peter Kharchenko [aut],
Viktor Petukhov [aut],
Dirk Eddelbuettel [ctb],
Evan Biederstedt [cre, aut]

Maintainer Evan Biederstedt <evan.biederstedt@gmail.com>

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R topics documented:

checkOpenMP .................................................. 2
crossKnn .......................................................... 2
Knn ............................................................... 3

Index 5

checkOpenMP  boolean to check OpenMP exists

description

boolean to check OpenMP exists

usage

checkOpenMP()

crossKnn  Perform fast approximate K-nearest neighbor search of rows input matrix mA in rows of matrix mB.

description

Perform fast approximate K-nearest neighbor search of rows input matrix mA in rows of matrix mB.

usage

crossKnn(
    mA,
    mB,
    k,
    nThreads = 10L,
    verbose = TRUE,
    indexType = "angular",
    M = 12L,
    MaxM0 = 24L,
    ef_search_multiplier = 50,
    quiet = FALSE
)
**Arguments**

mA  
Input numeric matrix of data

mB  
Input numeric matrix of data

k  
Integer number of clusters

nThreads  
Integer number of threads (default=10)

verbose  
Boolean flag for verbose output (default=FALSE)

indexType  
Metric distance type, which can be "angular" or "L2" (default="angular")

M  
Integer number of connections (default=12) The NSW graph is constructed via consecutive insertion of elements in random order by bidirectionally connecting them to the M closest neighbors from the previously inserted elements.

MaxM₀  
Integer maximum number of connections that an element can have in the zero layer. (default=24) It is recommended that MaxM₀ not exceed 2*M.

ef_search_multiplier  
Integer multiplier to calculate candidate nearest neighbors, set to k*ef_search_multiplier (default=50). Refer to the parameters er and efConstruction in Malkov & Yashunin (2020) doi: 10.1109/TPAMI.2018.2889473

quiet  
Boolean flag specifically for Rcpp warnings (default=FALSE)

**Value**

clusters per row in sparse Matrix of class "dgCMatrix" of dimensions mB rows by mA rows

**Examples**

data(iris)
iris_df = data.matrix(iris[-5]) ## convert to a numeric matrix
crossKnn(mA=iris_df, mB=head(iris_df, 50), 4)

---

**Knn**

Perform fast approximate K-nearest neighbor search on rows of the input matrix m.

**Description**

Perform fast approximate K-nearest neighbor search on rows of the input matrix m.

**Usage**

Knn(
    m,  
    k,  
    nThreads = 10L,  
    verbose = TRUE,
Knn

```r
indexType = "angular",
M = 12L,
MaxM0 = 24L,
ef_search_multiplier = 50,
quiet = FALSE
```

**Arguments**

- **m**: Input numeric matrix of data
- **k**: Integer number of clusters
- **nThreads**: Integer number of threads (default=10)
- **verbose**: Boolean flag for verbose output (default=FALSE)
- **indexType**: Metric distance type, which can be "angular" or "L2" (default="angular")
- **M**: Integer number of connections (default=12) The NSW graph is constructed via consecutive insertion of elements in random order by bidirectionally connecting them to the M closest neighbors from the previously inserted elements.
- **MaxM0**: Integer maximum number of connections that an element can have in the zero layer. (default=24) It is recommended that MaxM0 not exceed 2*M.
- **ef_search_multiplier**: Integer multiplier to calculate candidate nearest neighbors, set to k*ef_search_multiplier (default=50). Refer to the parameters er and efConstruction in Malkov & Yashunin (2020) doi: 10.1109/TPAMI.2018.2889473
- **quiet**: Boolean flag specifically for Rcpp warnings (default=FALSE)

**Value**

clusters per row in sparse Matrix of class "dgCMatrix" of dimensions m rows by m rows

**Examples**

```r
data(iris)
iris_df = data.matrix(iris[-5]) ## convert to a numeric matrix
Knn(m=iris_df, 4)
```
Index

cHECKOPENMP, 2
crossKnn, 2

Knn, 3