

Package ‘TrajectoryMarkovAnalysis’

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Type Package

Title Package for creating Markov models for patient-orientated trajectories.

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Description R-package TrajectoryMarkovAnalysis specializes on modelling patient trajectories using Markov chains. The package supports discrete and continuous time Markov models, Kaplan-Meier plots, Markov trees and synthetic data generation. The package is based on OMOP CDM.

License GPL (>= 2)

Imports Rcpp (>= 1.0.7),

sunburstR,
htmlwidgets,
shiny,
shinydashboard,
shinycssloaders,
DT,
matrixcalc,
dplyr,
plyr,
tidyr,
shinyMatrix,
msm,
stringr,
survival,
survminer,
ggplot2,
ggpubr,
ggraph,
igraph,
stats,
formattable,
utils

Remotes OHDSI/DatabaseConnector,
OHDSI/ParallelLogger,
OHDSI/SqlRender

Suggests testthat

LinkingTo Rcpp

RoxygenNote 7.1.1

R topics documented:

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TrajectoryMarkovAnalysis-package
This package creates Markov models for patient-orientated trajectories.

Description

R-package TrajectoryMarkovAnalysis specializes on modelling patient trajectories using Markov chains. The package supports discrete and continuous time Markov models, Kaplan-Meier plots, Markov trees and synthetic data generation. The package is based on OMOP CDM. License: GPL (>= 2)

Author(s)

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References

This optional section can contain literature or other references for background information.

See Also

HealthInformaticsUT/Cohort2Trajectory, HealthInformaticsUT/TrajectoryViz

Examples

```
## Not run:
## Optional simple examples of the most important functions
## These can be in \dontrun{} and \donttest{} blocks.

## End(Not run)
```

```
generateDataContinuous
```

Generate patient trajectories

Description

This function outputs a data.frame object which describes the movement of patients between the defined states and state duration

Usage

```
generateDataContinuous(
  model,
  n = 100,
  minDate = "1900-01-01",
  maxDate = "2021-12-31",
  pathToResults = getwd(),
  generateCost = 0,
  statisticsTable = NULL,
  studyName = ""
)
```

Arguments

model	The markov model calculated using msm package
n	Number of patients' trajectories to generate
minDate	Smallest possible trajectory start date
maxDate	Largest possible trajectory start date
pathToResults	Path to temp folder for saving objects
generateCost	Value [0,1] indicating whether to generate cost of states
statisticsTable	Table retrieved from observed data for cost values
studyName	Customized study name

generateDataDiscrete *Generate patient trajectories*

Description

This function outputs a data.frame object which describes the movement of patients between the defined states and state duration

Usage

```
generateDataDiscrete(
  transitionMatrix,
  n = 100,
  minDate = "1900-01-01",
  maxDate = "2021-12-31",
  maxOut = 183,
  stateDuration = 30,
  pathToResults = getwd(),
  generateCost = 0,
  statisticsTable = NULL,
  studyName = ""
)
```

Arguments

transitionMatrix	The transition matrix for states
n	Number of patients' trajectories to generate
minDate	Smallest possible trajectory start date
maxDate	Largest possible trajectory start date
maxOut	Maximum nr of days patient can be out of cohort
pathToResults	Path to temp folder for saving objects
generateCost	Value [0,1] indicating whether to generate cost of states
statisticsTable	Table retrieved from observed data for cost values
studyName	Customized study name

runDashboard	<i>This function starts the dashboard application for comparing results from different databases</i>
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Description

This function starts the dashboard application for comparing results from different databases

Usage

```
runDashboard(pathToResults = NULL)
```

Arguments

pathToResults Path to target directory where results will be saved

runGUI	<i>This function initiates the connection with database and starts Shiny application</i>
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Description

This function initiates the connection with database and starts Shiny application

Usage

```
runGUI(  
  connection,  
  connectionDetails,  
  pathToDriver = "./Drivers",  
  dbms = "postgresql",  
  cdmSchema = "ohdsi_cdm",  
  cdmTmpSchema = "ohdsi_temp",  
  cdmResultsSchema = "ohdsi_results",  
  studyName = "MarkovAnalysis",  
  pathToResults = NULL,  
  databaseDescription = "A cool database."  
)
```

Arguments

pathToDriver Path to a folder containing the JDBC driver JAR files. See `downloadJdbcDrivers` for instructions on how to download the relevant drivers.

dbms The type of DBMS running on the server. Valid values are: 'oracle', 'postgresql', 'redshift', 'sql server', 'pdw', 'netezza', 'bigquery', 'sqlite', 'sqlite extended', 'spark'

cdmSchema	Schema which contains the OHDSI Common Data Model.
cdmTmpSchema	Schema for temporary tables
cdmResultsSchema	Schema which has the information about the cohorts created in Atlas
pathToResults	Path to target directory where results will be saved
databaseDescription	Information about the OMOP CDM database data

TrajectoryMarkovAnalysis

This function outputs Markov model fitted from observed data

Description

This function outputs Markov model fitted from observed data

Usage

```
TrajectoryMarkovAnalysis(
  conn,
  dbms,
  cdmSchema,
  cdmTmpSchema,
  inputData,
  modelType,
  studyName,
  pathToResults = getwd(),
  excludedStates = c(),
  costDomains = c("Drug", "Visit", "Procedure", "Device", "Measurement", "Observation",
    "Specimen"),
  databaseDescription = "A cool database"
)
```

Arguments

conn	Connection to the database
dbms	Database dialect
cdmSchema	OHDSI OMOP CDM tabels' schema
cdmTmpSchema	Table for creating temp tables
inputData	Observed trajectories data outputted by Cohort2Trajectory package
modelType	Markov model type can be "discrete" or "continuous"
studyName	Customized study name
pathToResults	The path where results will be saved
excludedStates	States which have to be discarded from the study

costDomains Cost domains to include in cost analysis

databaseDescription

Information about the OMOP CDM database data

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