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:

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)
```

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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

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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

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runGUI *This function initiates the connection with database and starts Shiny application*

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
)
```

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

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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")
)
```

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

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