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Discretizing the Distribution of a Population following a Discrete-time Markov Chain on a Continuous State Space

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Abstract

Package **discretizeCtsDTMC** creates a discrete approximation to a Markov process defined on a continuous state space in discrete time. Once the state space is discretized, **discretizeCtsDTMC** provides tools to estimate the transition matrices and analyze the Markov process. It is used to model a population of individuals, each following a continuous-state Markov process in discrete time.

We'll choose a better name later.

Keywords: Markov chain, Markov process, discretization.

1. Markov Chains in R

This article illustrates how to creates a discrete approximation to a Markov process defined on a continuous state space in discrete time. Once the state space is discretized, **discretizeCtsDTMC** provides tools to estimate the transition matrices and analyze the Markov process. It is used to model a population of individuals, each following a continuous-state Markov process in discrete time.

The R packages (R Core Team 2017) available for working with Markov chains is as follows...

Figure 1: Caption goes here

2. Model

Harry, put all that good stuff here.

3. Example

A demonstration of analysis is shown in `discCtsDTMC_demo.R` and it serves as an example of what a typical session of model specification, estimation and testing can include. This procedure includes the following steps:

1. Organizing data
2. Choosing estimation options
3. Lag selection
4. Model estimation

5. Hypothesis testing

3.1. Organizing data

3.2. Choosing options

3.3. Lag-order selection

3.4. Model estimation

3.5. Hypothesis testing

4. Summary and discussion

This is a good package because...

Computational details

The results in this paper were obtained using R 3.5.1. with the **discreteCtsDTMC** package Version 0.0.0.9000. R itself and all packages used are available from the Comprehensive R Archive Network (CRAN) at https://CRAN.R-project.org/.

The development version of this package is available by using the **devtools** package, with which the latest version can be installed by

`devtools::install_github(LeeMorinUCF/discreteCtsDTMC)`.

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References

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