Package 'statnet'

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Title Software Tools for the Statistical Analysis of Network Data

Depends R (>= 3.0), network (>= 1.12), networkDynamic (>= 0.7.1), ergm (>= 3.4.0), sna (>= 2.3.2), tergm (>= 3.3.0), ergm.count (>= 3.1.1)

Suggests networksis (>= 2.1.3), degreenet (>= 1.3), relevent (>= 1.0.4), ndtv (>= 0.6.1), EpiModel (>= 1.1.6), latentnet (>= 2.7.1)

Imports statnet.common (>= 3.2.2)

Description An integrated set of tools for the representation, visualization, analysis, and simulation of network data. For an introduction, type help(package='statnet').

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URL http://statnet.org

NeedsCompilation no

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R topics documented:

`statnet-package` *A Suite of Packages for the Statistical Modeling of Network Data*

Description

statnet is a suite of software packages for statistical network analysis. The packages implement recent advances in network modeling based on exponential-family random graph models (ERGM), as well as latent space models and more traditional network methods. The components of the package provide a comprehensive framework for ERGM-based network modeling: tools for model estimation, for model evaluation, for model-based network simulation, and for network visualization. This broad functionality is powered by a central Markov chain Monte Carlo (MCMC) algorithm. The coding is optimized for speed and robustness.

Details

statnet packages are written in a combination of R and `C` It is usually used interactively from within the R graphical user interface via a command line. it can also be used in non-interactive (or "batch") mode to allow longer or multiple tasks to be processed without user interaction. The suite of packages are available on the Comprehensive R Archive Network (CRAN) at `http://www.r-project.org/` and also on the **statnet** project website at `http://statnet.org/`

The **statnet** suite of packages has the following components:

- **ergm** is a collection of functions to fit, simulate from, plot and evaluate exponential random graph models. The main functions within the **ergm** package are `ergm`, a function to fit linear exponential random graph models in which the probability of a graph is dependent upon a vector of graph statistics specified by the user; `simulate`, a function to simulate random graphs using an ERGM; and `gof`, a function to evaluate the goodness of fit of an ERGM to the data. **ergm** contains many other functions as well.
- **tergm** is a collection of extentions to **ergm** enabling it to fit models for dynamic networks.
- **ergm.count** is an extension to **ergm** enabling it to fit models for networks whose relations are counts.
- **ergm.userterms** provides a template for implementing new ERGM terms.
- **sna** is a set of tools for traditional social network analysis.
- **degreenet** is a package for the statistical modeling of degree distributions of networks. It includes power-law models such as the Yule and Waring, as well as a range of alternative models that have been proposed in the literature.
- **latentnet** is a package to fit and evaluate latent position and cluster models for statistical networks The probability of a tie is expressed as a function of distances between these nodes in a latent space as well as functions of observed dyadic level covariates.
- **networksis** is a package to simulate bipartite graphs with fixed marginals through sequential importance sampling.
- **relevent** is a package providing tools to fit relational event models.

- **network** is a package to create, store, modify and plot the data in network objects. The network object class, defined in the **network** package, can represent a range of relational data types and it supports arbitrary vertex / edge /graph attributes. Data stored as network objects can then be analyzed using all of the component packages in the **statnet** suite.
- **networkDynamic** extends **network** with functionality to store information about about evolution of a network over time, defining a networkDynamic object class.
- **ndtv**: (Network Dynamic Temporal Visualization): Exports dynamic network data from networkDynamic objects as animated movies or other representations of relational structure and node attributes that change over time.
- **EpiModel**: Tools for building, solving, and plotting mathematical models of infectious disease, including stochastic models of disease on dynamic networks with demographic processes.

statnet is a metapackage, depending on all of the above packages, so that they can be installed together.

Each of these components is described in detail in the references below. Loading the **statnet** package into R automatically loads them all. Each package has associated help files and internal documentation that is supported by the information on the Statnet Project website (http://statnet.org/). A tutorial, support mailing list, references and links to further resources are provided there.

When publishing results obtained using this package the original authors are to be cited as described in `citation("statnet")`. In addition, please cite the specific package that you use.

We have invested a lot of time and effort in creating the statnet suite of packages for use by other researchers. lease cite it in all papers where it is used.

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update_statnet *Update the Component Packages of the Statnet Suite*

Description

A wrapper around update.packages to update the component packages of Statnet Suite to their latest versions.

Usage

```
update_statnet(..., ask = FALSE, checkBuilt = TRUE, addURLs = character())
```

Arguments

ask, checkBuilt	Arguments to update.packages documentation. The defaults are different from those of that function.
addURLs	Optional repository URLs in addition to CRAN, such as http://statnet.csde.washington.edu/preview. Defaults to none.
...	Additional arguments to be passed to update.packages.

Details

Updates the list component packages of Statnet Suite, using setRepositories and update.packages.

Since there are no good ways to update packages once they are loaded, this function should be called immediately after restarting R.

Value

update_statnet returns NULL invisibly.

See Also

setRepositories, update.packages, install.packages

Examples

```
## Not run:
# Update from CRAN
statnet::update_statnet()

# Update from statnet.org's preview release, taking packages from CRAN
# as needed
statnet::update_statnet(addURLs="http://statnet.csde.washington.edu/preview")

## End(Not run)
```

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