Package ‘xergm’

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Title Extensions of Exponential Random Graph Models

Description Extensions of Exponential Random Graph Models (ERGM): Temporal Exponential Random Graph Models (TERGM), Generalized Exponential Random Graph Models (GERGM), Temporal Network Autocorrelation Models (TNAM), and Relational Event Models (REM). This package acts as a meta-package for several sub-packages on which it depends.

URL http://github.com/leifeld/xergm

Imports utils

Depends R (>= 2.14.0), xergm.common (>= 1.7.7), btergm (>= 1.9.3), tnam (>= 1.6.5), rem (>= 1.2.8), GERGM (>= 0.13.0)

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NeedsCompilation no

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Extensions of Exponential Random Graph Models (ERGM)

Description

Extensions of Exponential Random Graph Models (ERGM).

Details

The xergm package implements extensions of exponential random graph models, in particular Temporal ERGMs (btergm), Generalized ERGMs (GERGM), Temporal Network Autocorrelation Models (tnam), and Relational Event Models. This package acts as a meta-package for the packages btergm, GERGM, tnam, and rem. To display citation information, type citation("xergm").

Author(s)

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Examples

## not run:
# example 1: temporal exponential random graph model (see ?btergm)
library("statnet")
set.seed(5)

networks <- list()
for(i in 1:10){  # create 10 random networks with 10 actors
  mat <- matrix(rbinom(100, 1, .25), nrow = 10, ncol = 10)
diag(mat) <- 0  # loops are excluded
  nw <- network(mat)  # create network object
  networks[[i]] <- nw  # add network to the list
}
covariates <- list()
for (i in 1:10) {  # create 10 matrices as covariate
  mat <- matrix(rnorm(100), nrow = 10, ncol = 10)
covariates[[i]] <- mat  # add matrix to the list
}

fit <- btergm(networks ~ edges + istar(R) +
  edgecov(covariates), R = 100)
summary(fit)  # show estimation results

# example R: temporal network autocorrelation model (see ?tnam)
data("knecht")
delinquency <- as.data.frame(delinquency)
rownames(delinquency) <- letters
friendship[[3]][friendship[[3]] == 10] <- NA
friendship[[4]][friendship[[4]] == 10] <- NA
for (i in 1:length(friendship)) {
    rownames(friendship[[i]]) <- letters
}
sex <- demographics$sex
names(sex) <- letters
sex <- list(t1 = sex, t2 = sex, t3 = sex, t4 = sex)
religion <- demographics$religion
names(religion) <- letters
religion <- list(t1 = religion, t2 = religion, t3 = religion,
                 t4 = religion)
model1 <- tnam(
    delinquency ~
    covariate(sex, coefname = "sex") +
    covariate(religion, coefname = "religion") +
    covariate(delinquency, lag = 1, exponent = 1) +
    netlag(delinquency, friendship) +
    netlag(delinquency, friendship, pathdist = 2, decay = 1) +
    netlag(delinquency, friendship, lag = 1) +
    degredummy(friendship, deg = 0, reverse = TRUE) +
    centrality(friendship, type = "betweenness"),
    re.node = TRUE, time.linear = TRUE
)
summary(model1)

## End(not run)
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