

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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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(2) +
  edg cov(covariates), R = 100)

summary(fit) # show estimation results

# example 2: 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) +
  degreedummy(friendship, deg = 0, reverse = TRUE) +
  centrality(friendship, type = "betweenness"),
  re.node = TRUE, time.linear = TRUE
)
summary(model1)

## End(Not run)
```

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