Assignments No. 9

released: 07.01.2015   due: 13.01.2015 at 12:00h

Task 1: Creating and terminating ties 10 points

Let $x(t_0)$ and $x(t_1)$ be two observations of a network at two time points $t_0$ and $t_1$ and $v$ a binary attribute (e.g., gender). We consider a stochastic actor-oriented model for undirected ties assuming that the initiative is two-sided and the choice is dictatorial.

Consider an evaluation function based on edges, reciprocity, and homophily with respect to $v$. Is there an ERGM which is the limiting distribution of this SAOM?

Task 2: Creating and terminating ties – R task 10 points

Let us consider the data collected by Andrea Knecht.

(a) Estimate a SAOM specified by the following effects: outdegree and reciprocity. The reciprocity effect should appear in both the evaluation function and the endowment function.

(a.1) Compute the gain/loss in the utility function when
- a tie not reciprocating an existing tie is maintained
- a tie reciprocating an existing tie is dissolved

(a.2) Comment the results in (a.1)

(b) Add the transitive triplets and the 3-cycles to the model. Estimate the model.

(c) Add one or more effects in order to test the hypothesis that terminating a tie closing a transitive triad is not attractive for an actor. Is the hypothesis supported by the data?
(d) Add one or more effects to test if homophily with respect to gender and similarity with respect to delinquency favour either the creation or the maintenance of friendship ties.

(e) Compare your results with those deriving from the estimation of the STERGMs (last slide on Temporal Exponential Random Graph Models)